COMPLIANCE WORLDWIDE INC.
TEST REPORT 277-06

In Accordance with the Requirements of

FCC CFR Title 47 Part 90

Issued to

ADC Telecommunications, Inc.
P.O. Box 1101
Minneapolis, MN 55440-1101
(952) 403-8340

for

Digivance NXD SMR 900 MHz

Report Issued on October 17, 2006

Prepared by

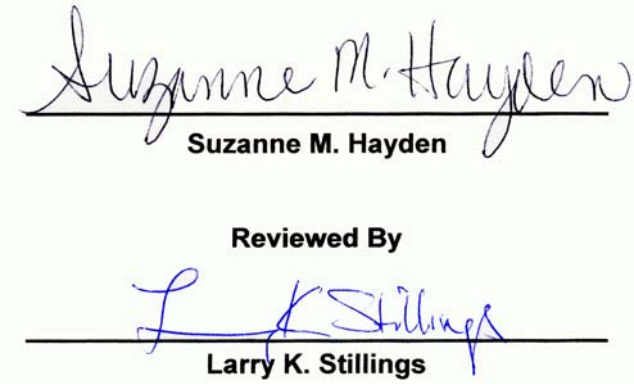


Table of Contents

1. Scope

This test report certifies that the ADC Digivance NXD SMR 900 MHz as tested, meets the regulatory agency standards listed on the cover page of this document. The scope of this test report is limited to the test sample provided by the client, only in as much as that sample represents other production units. If any significant changes are made to the unit, the changes shall be evaluated and a retest may be required.

2. Product Details

2.1. Manufacturer: ADC Telecommunications, Inc.

2.2. Model Number: DGVN-0200000011NRN

2.3. Serial Number: N/A

2.4. Description: Transports RF between a remote antenna and base station

2.5. Power Source: 120 V, 60 Hz (4.4 A)

2.6. EMC Modifications: None

3. Product Configuration

3.1. Contents of EUT

Description	Manufacturer	Manufacturer p/n	Serial number
HUB	ADC	OP-DC-DIGCH2	N/A
RAN	ADC	DGVN-0200000011NRN	N/A

3.2. Cables

Cable Type	Length	From	To
Power	> 3M	Power	Input power
RF	> 3M	Cabinet	Measurement Equipment

3.3. Support Equipment

Device	Manufacturer	Model	Serial No.
HUB	ADC	OP-DC-DIGCH2	N/A
Signal Generator	Agilent	E4436B	N/A
Power Supply	Lambda	FE150048-RA	N/A
Spectrum Analyzer	HP	HP8563E	N/A

3. Product Configuration (continued)

3.4. Operational Characteristics

Digivance Element Management System (DEMS). System Management and Interface Matching Software.

SNMP v1 & v2

3.5 Test Operation Mode

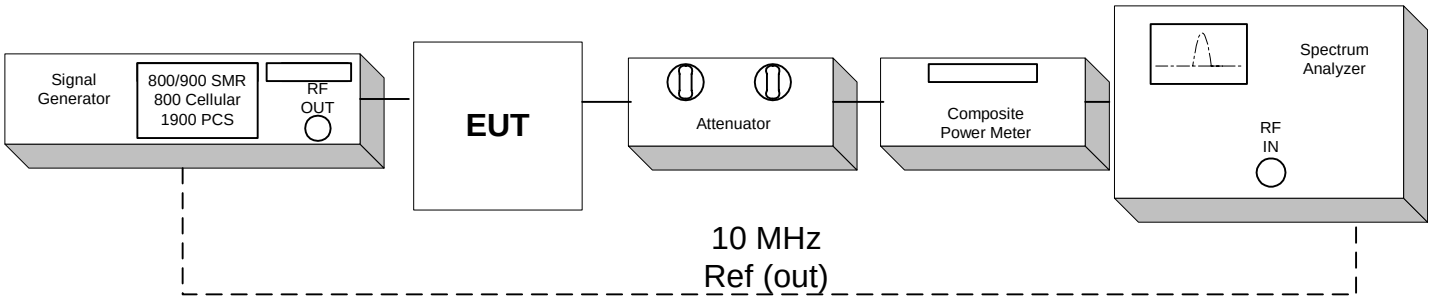
The unit under test was operated under the following conditions during emissions testing: Max composite in – Max composite out.

The unit under test, Digivance NXD Remote Transmitter, was tested; the host (HUB) portion is ancillary equipment and was not included with equipment under test.

4. Product Block Diagram

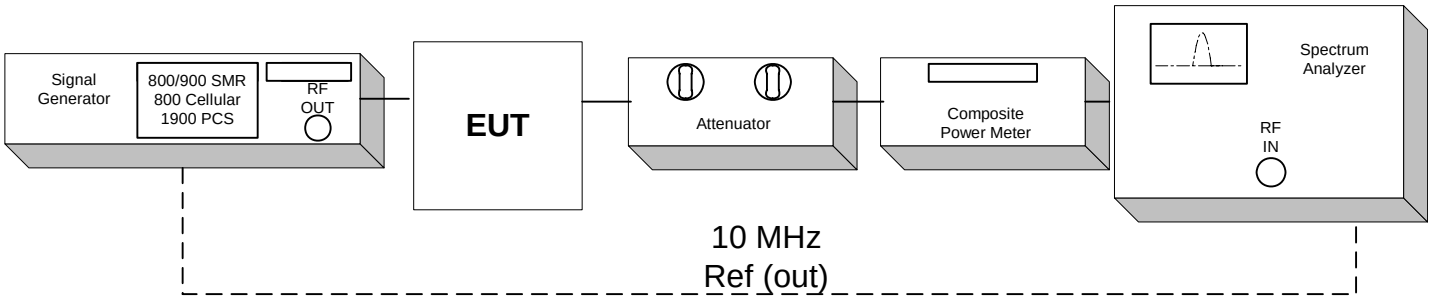
Radiated Emissions

Test Set-up



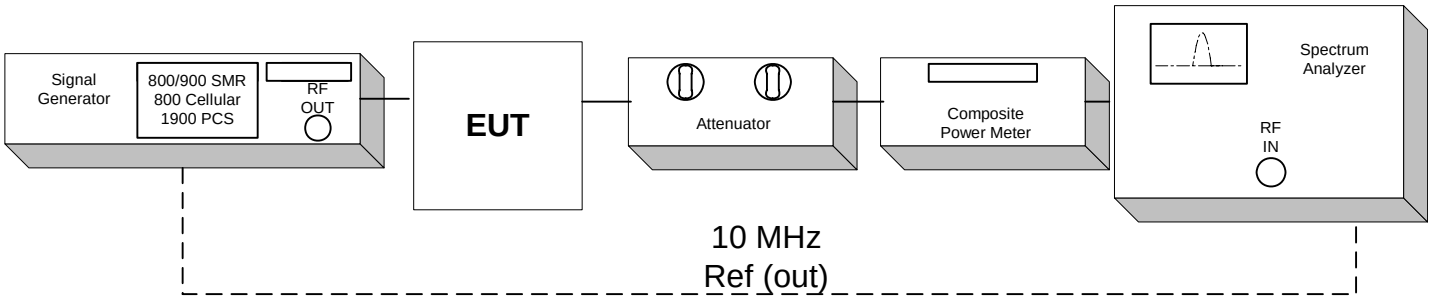
Conducted Emission Limits Test for ADC Inc.
Digivance® NXD SMR 900 MHz
Model Number DGVN-0200000011NRN

Test Set-up



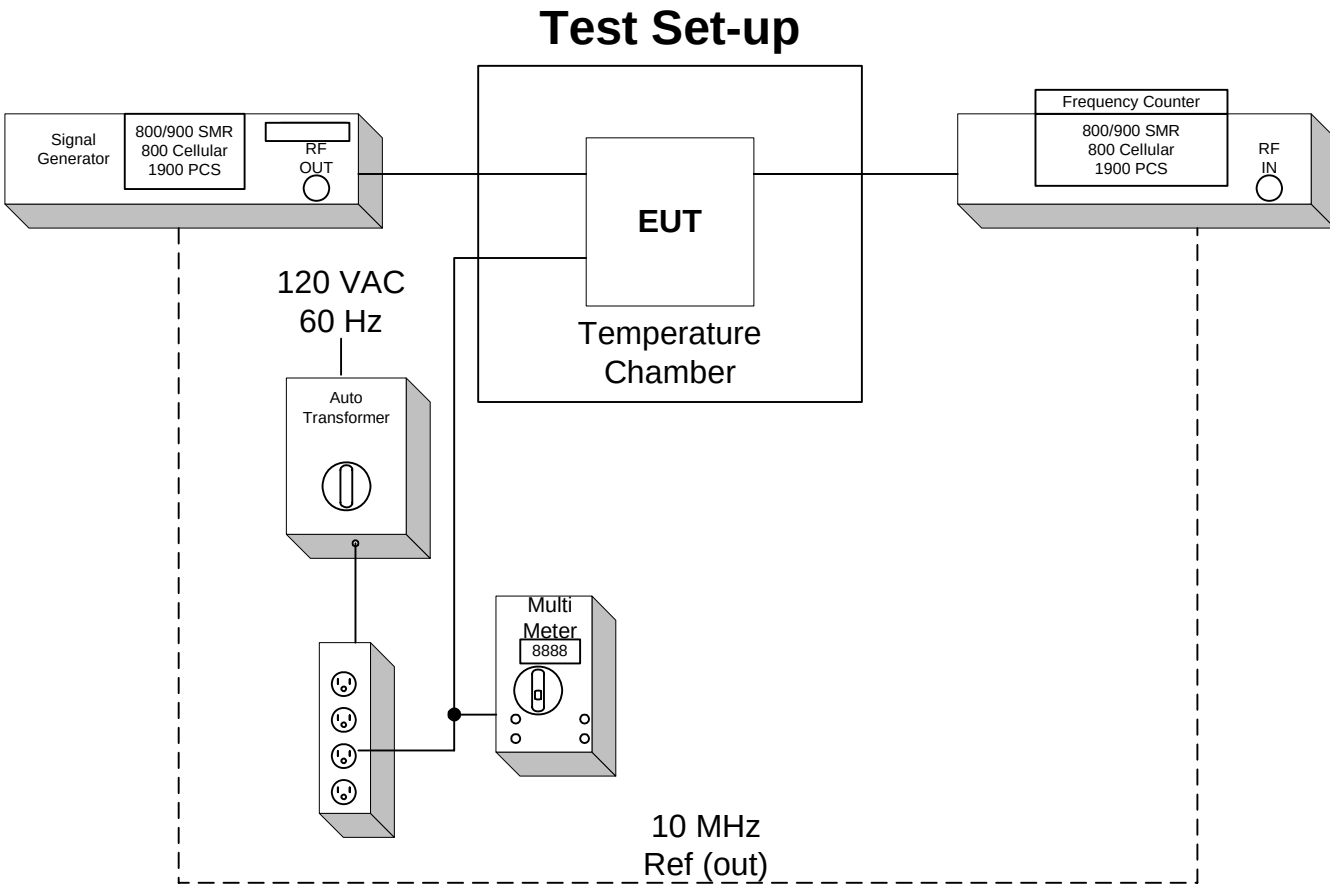
Conducted Output Power Test for ADC Inc.
Digivance® NXD SMR 900 MHz
Model Number DGVN-0200000011NRN

Test Set-up



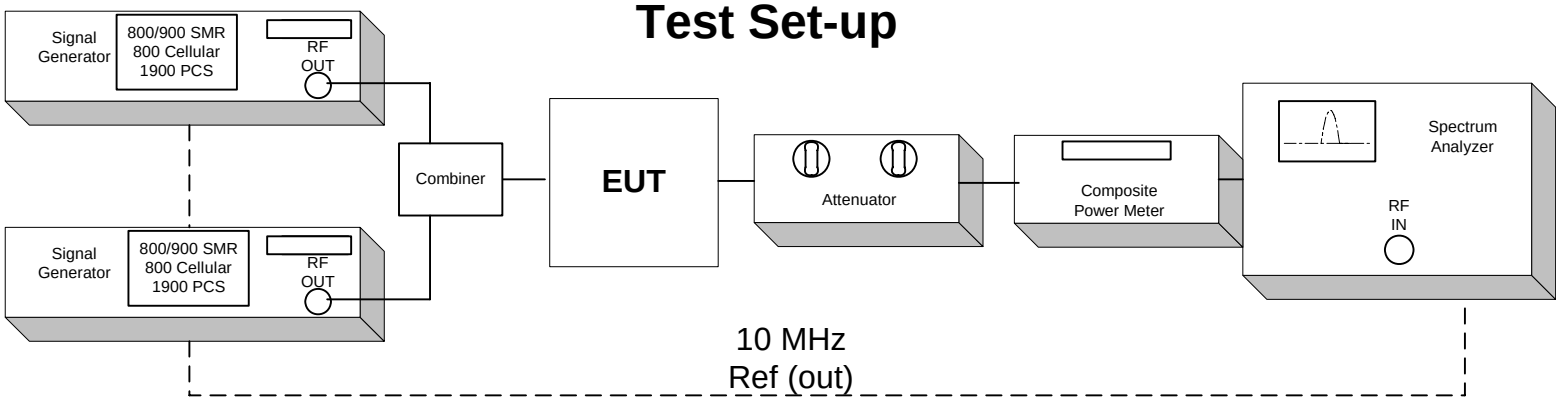
Frequency Tolerance Test for ADC Inc.
Digivance® NXD SMR 900 MHz
Model Number DGVN-0200000011NRN

EUT Host is specified for indoor use only with temperature range of 0° to +50° C, and was tested with its range.
EUT Remote is specified with a temperature range of -40° to +50° C and was tested with its range.



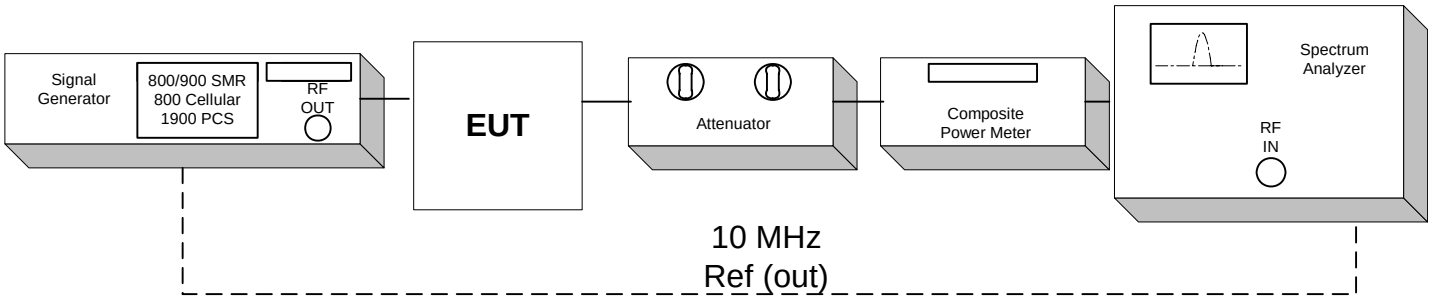
Inter-Modulation Test for ADC Inc.
Digivance® NXD SMR 900 MHz
Model Number DGVN-0200000011NRN

Test Set-up



Occupied Bandwidth Modulation Test for ADC Inc.
Digivance® NXD SMR 900 MHz
Model Number DGVN-0200000011NRN

Test Set-up



5. Limitations on Power and Antenna Height, FCC Part 90.635

5.1. Regulatory Limit:

Out of Band emissions:
Attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.
(19 dBm – [43 + 10log(0.08W)]) = -13 dBm

Outside of the carrier emission bandwidth: 26 dB below the transmitter power

5.2. Measurement Equipment Used to Perform Test

Equipment	MFG/Model	ADC Serial Number	Calibration Due. (NIST)
Spectrum Analyzer	HP/HP8563E	MC27690	12-22-06
Power Meter	HP / EPM-441A	MC27670	9-20-07
Signal Generator	Agilent E4436B	963739	10-16-06
Signal Generator	Agilent E4438C	1018532	3-13-08
Attenuator	Aeroflex / 49-30-33	N/A	CNR

Note: Any equipment used in testing that has a Calibration Not Required (CNR) listing is verified and compensated for with NIST traceable calibrated equipment.

5.3. Measurement & Equipment Setup

Test Date:	10/02/2006 – 10/03/2006
Test Location:	ADC Facility
Site Temperature (°C):	26
Relative Humidity (%RH):	22
Relative Barometric Pressure (%kPa):	98.6
Regulatory Limit:	500 Watts or 57 dBm
Results:	18.31 @ 940.0 MHz (iDEN)

Conducted Output Power Test for ADC Inc.
Digivance® NXD SMR 900 MHz
Model Number DGVN-0200000011NRN

*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 FM, iDEN, and 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 35.7 dB to compensate for attenuators and cable loss between the EUT and the power meter.

FM 7.24 Watts		**iDEN 7.40 Watts**	
Carrier Frequency	Carrier Output	Carrier Frequency	Carrier Output
935.0 MHz	38.48 dBm	935.0 MHz	38.59 dBm
937.5 MHz	38.06 dBm	937.5 MHz	38.18 dBm
940.0 MHz	38.60 dBm	940.0 MHz	38.69 dBm

CDMA 7.26 Watts	
Carrier Frequency	Carrier Output
935.0 MHz	38.61 dBm
937.5 MHz	38.49 dBm
940.0 MHz	38.38 dBm

7. Frequency stability, FCC Part 90.213

7.1. Regulatory Limit: The emission must stay within the authorized frequency block

7.2. Measurement Equipment Used to Perform Test

Equipment	MFG/Model	ADC Serial Number	Calibration Due. (NIST)
Multimeter	Fluke 87	MC20083	4-26-07
Freq. Counter	HP/5347A	MC27548	8-18-07
Variable Auto Transformer	Staco/1520CT	MC/44655	CNR
Temperature Chamber	Ecosphere	MC21679	12-27-06
Signal Generator	Agilent E4436B	963739	10-16-06

Note: Any equipment used in testing that has a Calibration Not Required (CNR) listing is verified and compensated for with NIST traceable calibrated equipment.

7.3. Measurement & Equipment Setup

Test Date:	10/02/2006 – 10/03/2006
Test Location:	ADC Facility
Site Temperature (°C):	26
Relative Humidity (%RH):	22
Relative Barometric Pressure (%kPa):	98.6

Frequency Tolerance Test for ADC Inc.
Digivance® NXD SMR 900 MHz
Model Number DGVN-0200000011NRN

EUT SMR (900 MHz)

HOST	REMOTE			
Input Voltage	**Input Voltage**	**Carrier Frequency**	**Measured Frequency**	**Meets Requirements?**
-42 VDC	90 VAC	935.200 MHz	935.200 MHz	Yes
-48 VDC	120 VAC	935.200 MHz	935.200 MHz	Yes
-54 VDC	260 VAC	935.200 MHz	935.200 MHz	Yes
-42 VDC	90 VAC	937.500 MHz	937.500 MHz	Yes
-48 VDC	120 VAC	937.500 MHz	937.500 MHz	Yes
-54 VDC	260 VAC	937.500 MHz	937.500 MHz	Yes
-42 VDC	90 VAC	939.800 MHz	939.800 MHz	Yes
-48 VDC	120 VAC	939.800 MHz	939.800 MHz	Yes
-54 VDC	260 VAC	939.800 MHz	939.800 MHz	Yes
Temperature		**Carrier Frequency**	**Measured Frequency**	**Meets Requirements?**
-40 Deg. C		935.200 MHz	935.200 MHz	Yes
-30 Deg. C		935.200 MHz	935.200 MHz	Yes
-20 Deg. C		935.200 MHz	935.200 MHz	Yes
-10 Deg. C		935.200 MHz	935.200 MHz	Yes
0 Deg. C		935.200 MHz	935.200 MHz	Yes
10 Deg. C		935.200 MHz	935.200 MHz	Yes
20 Deg. C		935.200 MHz	935.200 MHz	Yes
30 Deg. C		935.200 MHz	935.200 MHz	Yes
40 Deg. C		935.200 MHz	935.200 MHz	Yes
50 Deg. C		935.200 MHz	935.200 MHz	Yes
-40 Deg. C		937.500 MHz	937.500 MHz	Yes
-30 Deg. C		937.500 MHz	937.500 MHz	Yes
-20 Deg. C		937.500 MHz	937.500 MHz	Yes
-10 Deg. C		937.500 MHz	937.500 MHz	Yes
0 Deg. C		937.500 MHz	937.500 MHz	Yes
10 Deg. C		937.500 MHz	937.500 MHz	Yes
20 Deg. C		937.500 MHz	937.500 MHz	Yes
30 Deg. C		937.500 MHz	937.500 MHz	Yes
40 Deg. C		937.500 MHz	937.500 MHz	Yes
50 Deg. C		937.500 MHz	937.500 MHz	Yes
-40 Deg. C		939.800 MHz	939.800 MHz	Yes
-30 Deg. C		939.800 MHz	939.800 MHz	Yes
-20 Deg. C		939.800 MHz	939.800 MHz	Yes
-10 Deg. C		939.800 MHz	939.800 MHz	Yes
0 Deg. C		939.800 MHz	939.800 MHz	Yes
10 Deg. C		939.800 MHz	939.800 MHz	Yes
20 Deg. C		939.800 MHz	939.800 MHz	Yes
30 Deg. C		939.800 MHz	939.800 MHz	Yes
40 Deg. C		939.800 MHz	939.800 MHz	Yes
50 Deg. C		939.800 MHz	939.800 MHz	Yes

9. Emission limits, FCC Part 90.669

9.1. Regulatory Limit: (Peak)

Frequency Range (MHz, GHz)	Distance (Meters)	Limit (dBµV/m)
30 MHz to 10 GHz	3	94 (-13dBm)

9.2. Measurement Equipment Used to Perform Test

Equipment	MFG/Model	ADC Serial Number	Calibration Due. (NIST)
Spectrum Analyzer	HP/HP8563E	MC27690	12-22-06
Power Meter	HP / EPM-441A	MC27670	9-20-07
Signal Generator	Agilent E4436B	963739	10-16-06
Attenuator	Aeroflex / 49-30-33	N/A	CNR

Note: Any equipment used in testing that has a Calibration Not Required (CNR) listing is verified and compensated for with NIST traceable calibrated equipment.

9.3. Measurement & Equipment Setup

Test Date:	10/02/2006 – 10/03/2006
Test Location:	ADC Facility
Site Temperature (°C):	26
Relative Humidity (%RH):	22
Relative Barometric Pressure (%kPa):	98.6
Frequency Range:	30 MHz to 10 GHz
Measurement Distance:	3 Meters
(30 MHz – 1 GHz) EMI Receiver IF - Avg Bandwidth:	120 kHz – 300 kHz
(> 1 GHz) EMI Receiver IF - Avg Bandwidth:	1 MHz – 3 MHz
Detector Functions:	Peak
Antenna Height:	1 to 4 meters

9.4. 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.

Occupied Bandwidth Modulation Test for ADC Inc.
Digivance® NXD SMR 900 MHz
Model Number DGVN-0200000011NRN

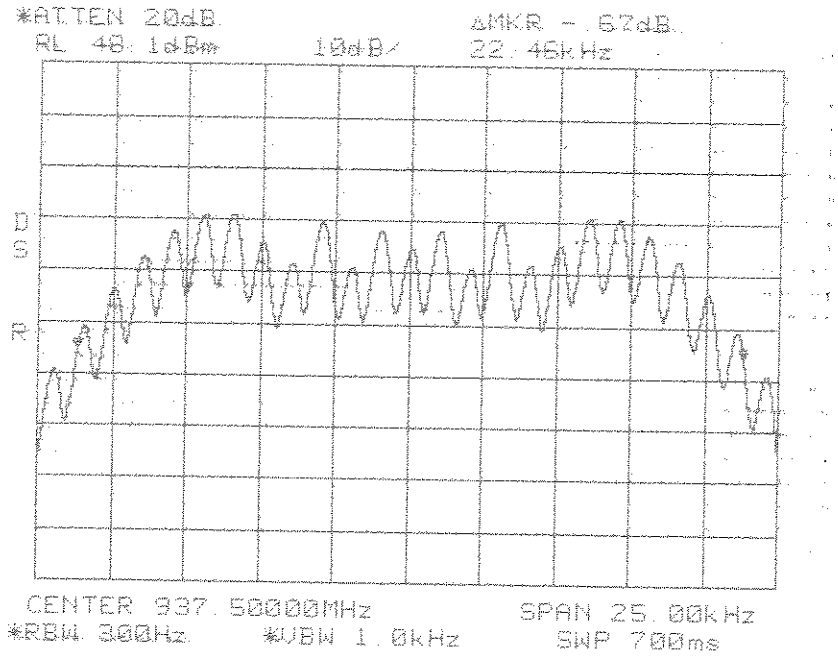
An input/output Occupied Bandwidth test was done with modulation types: FM, iDEN, and CDMA. The purpose was to determine the amount of distortion added to different types of modulation schemes by the EUT. The following plots show input signals vs. output signals.

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.

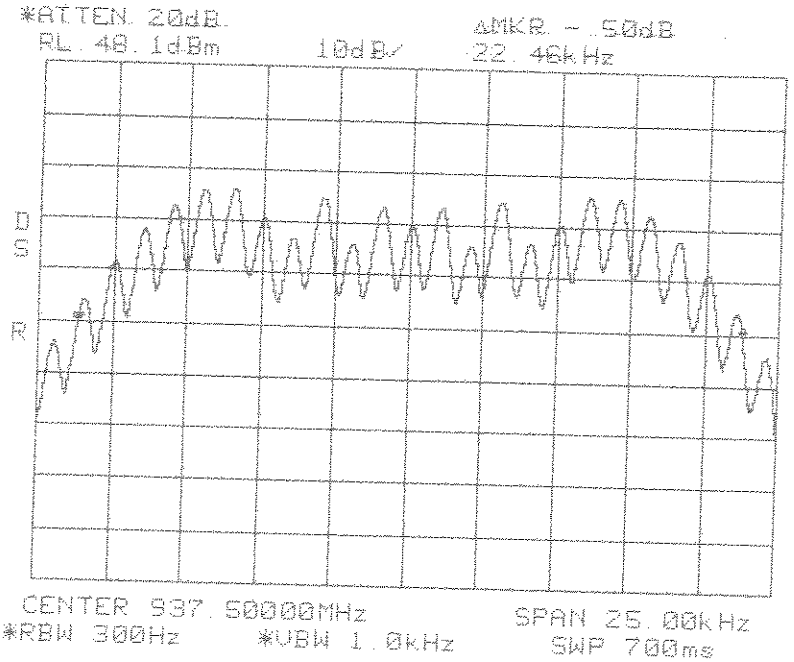
Results:

Pass (see plots)

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



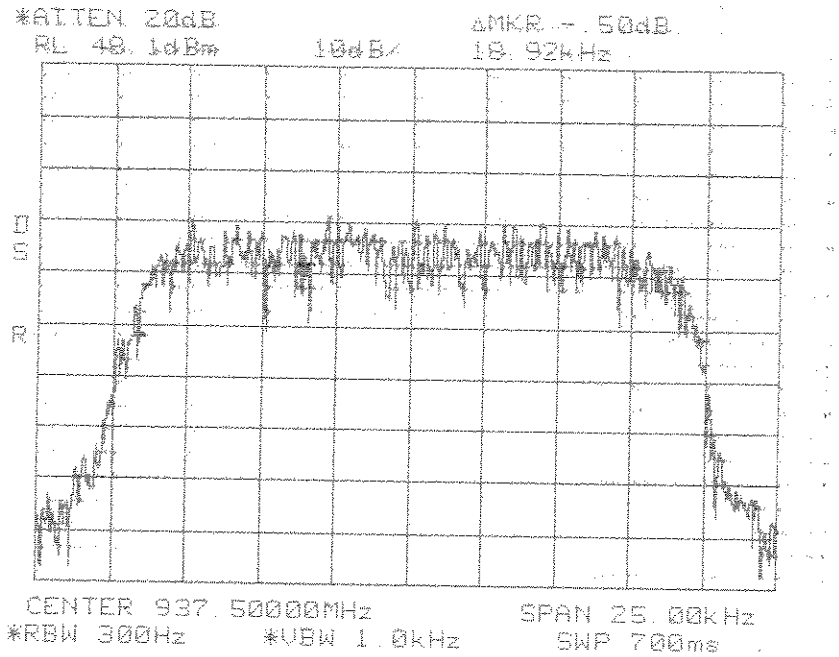
Occupied Bandwidth
FM
Signal In



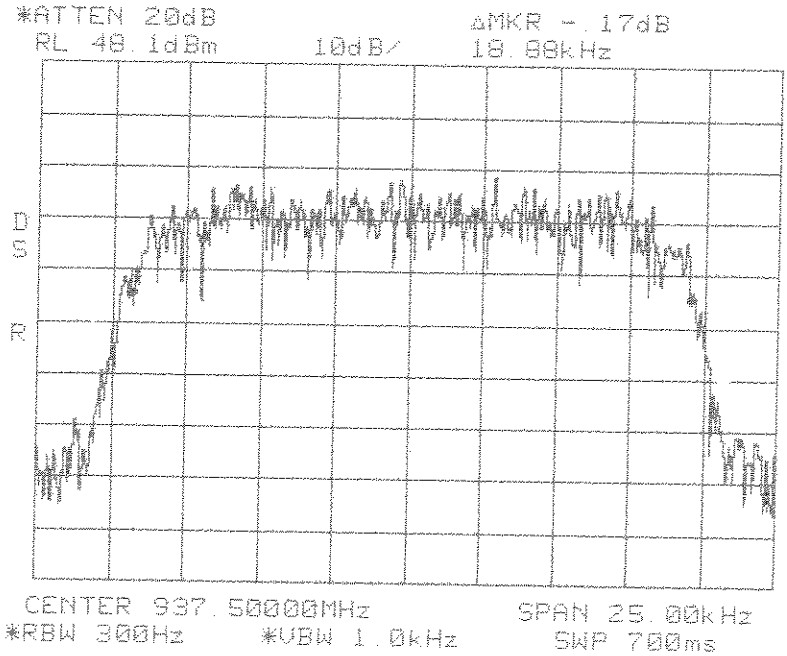
Occupied Bandwidth
FM
Signal Out

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

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



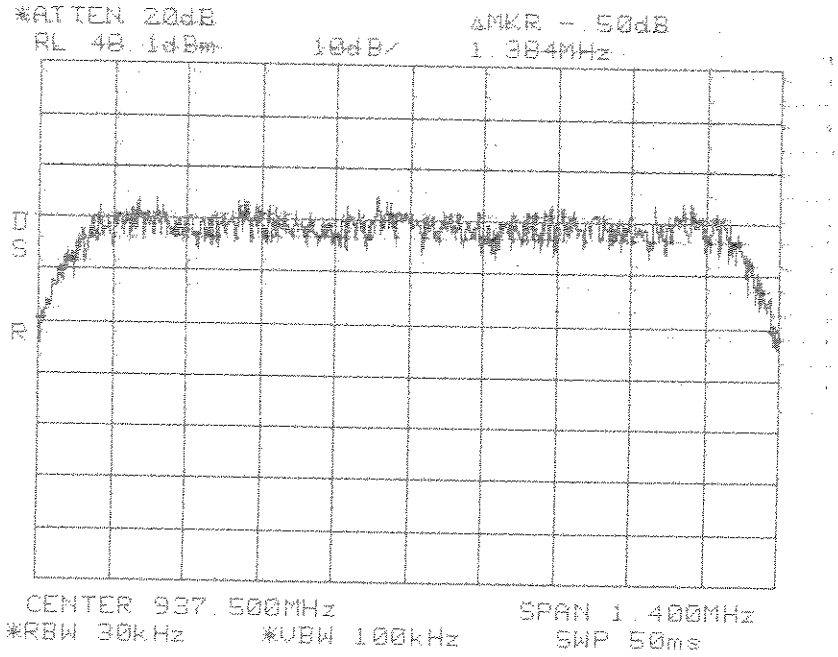
Occupied Bandwidth
iDEN
Signal In



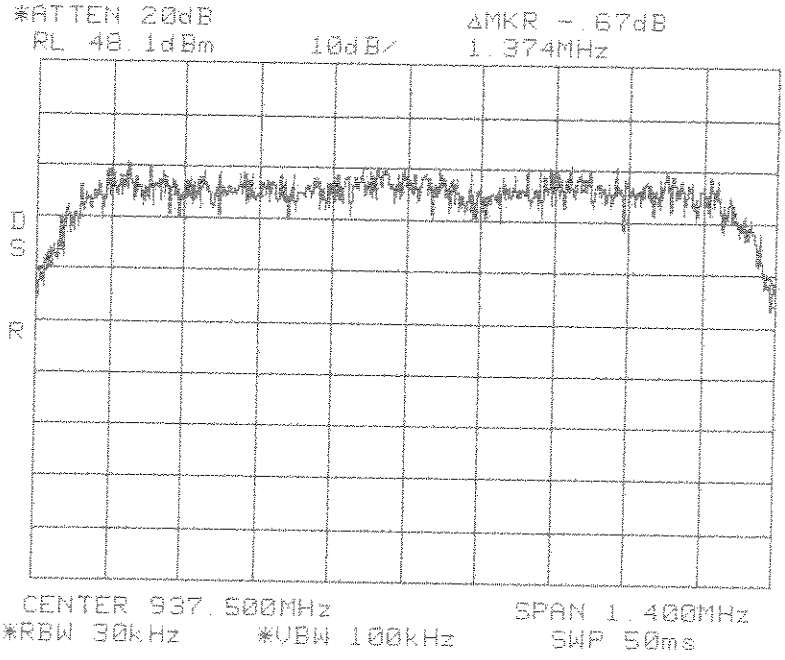
Occupied Bandwidth
iDEN
Signal Out

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

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



Occupied Bandwidth
CDMA
Signal In



Occupied Bandwidth
CDMA
Signal Out

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

Conducted Emission Limits Test for ADC Inc.
Digivance® NXD SMR 900 MHz
Model Number DGVN-0200000011NRN

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 FM, iDEN, and CDMA. The different signals were input one at a time to the EUT. In all cases, the out of band emissions were less than –13dBm from the equation

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

Band edge compliance is also demonstrated using a FM, iDEN, and CDMA signal at the upper and lower limits of the band.

The Host unit (HUB) connects directly to the BTS via coax. The HUB 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 ≈ -10 dBm input to HUB.
Industry practice has generally set the output signal power level.

HUB:
Range: -42 to -54 VDC
Tested @: -48 VDC
Tested @: 6.7 A

RAN:
Range: 90-260 VAC
Tested @: 120 VAC
Tested @: 4.3 A

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

The input to the HUB 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.

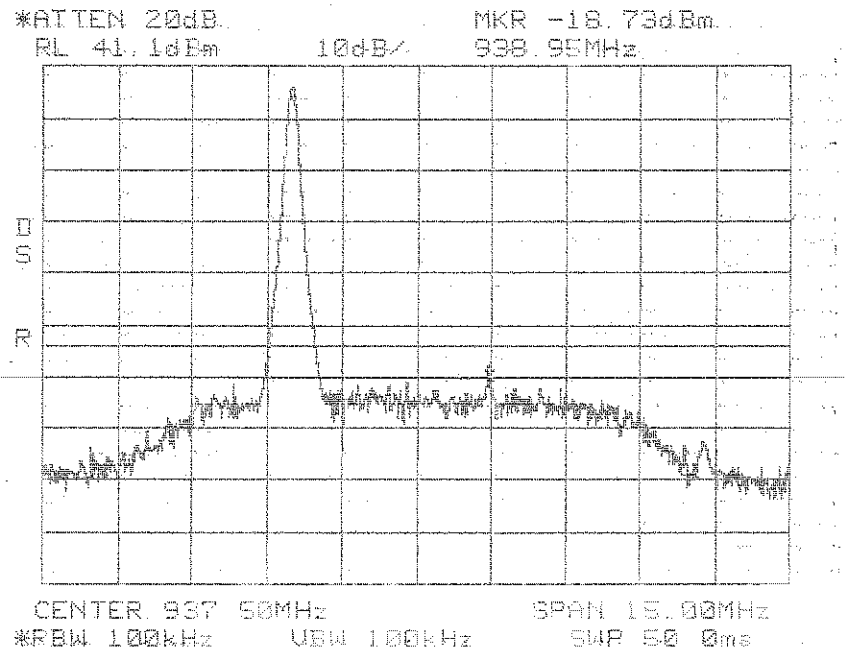
The spurious limitation is completed with the duplexer. The ALC also suppresses in-band spurious by preventing PA overdrive, while the duplexer suppresses out-of-band spurious.

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.

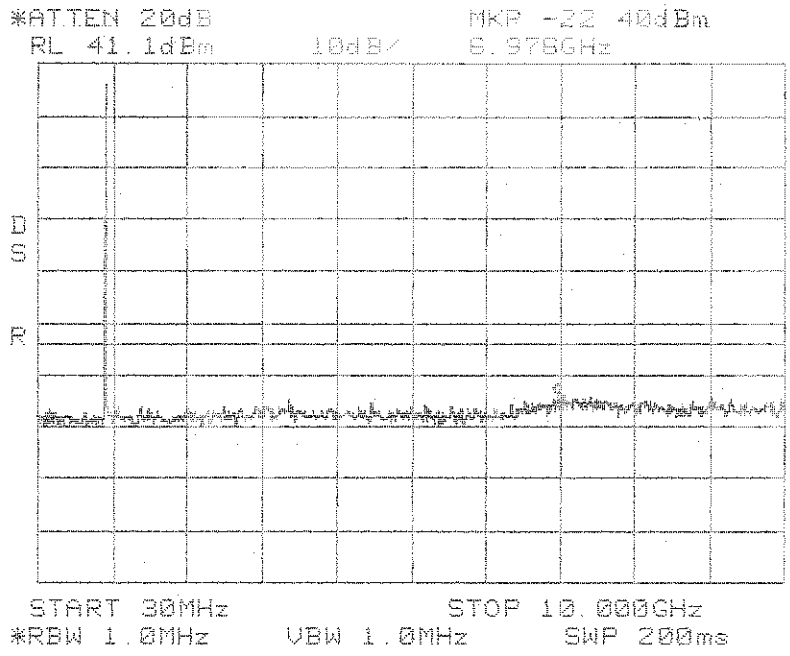
This is a constant gain device, so the setup controls the output. There is an overdrive and overpower limit control that prevents excess power.

Results:
Pass (See plots)

Center: 937.5 MHz
Span: 15 MHz
RBW/VBW: 100 kHz



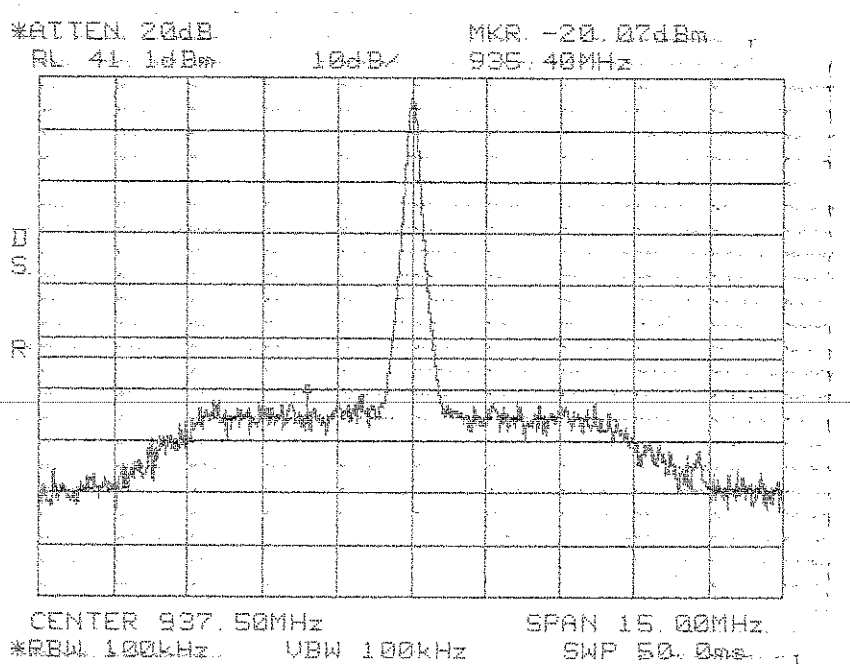
Conducted Emissions
Low
SMR 900 MHz



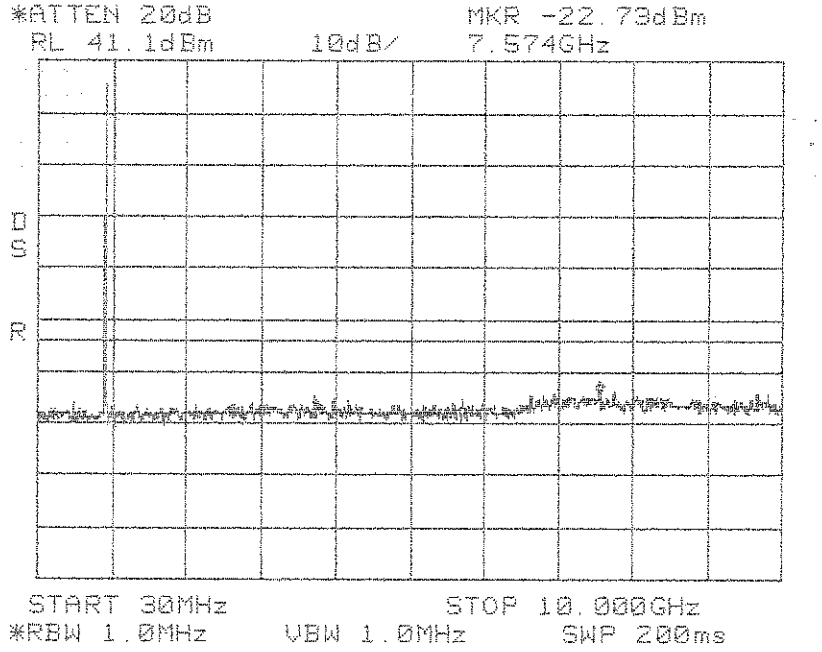
Conducted Emissions
Low
SMR 900 MHz

Span: 30 MHz to 10 GHz
RBW/VBW: 1 MHz

Center: 937.5 MHz
Span: 15 MHz
RBW/VBW: 100 kHz



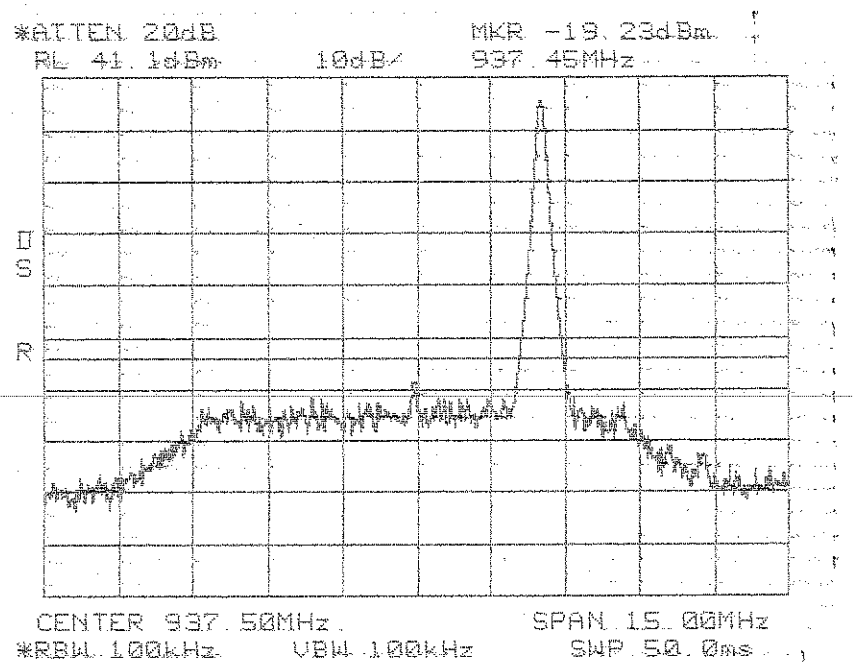
Conducted Emissions
Mid
SMR 900 MHz



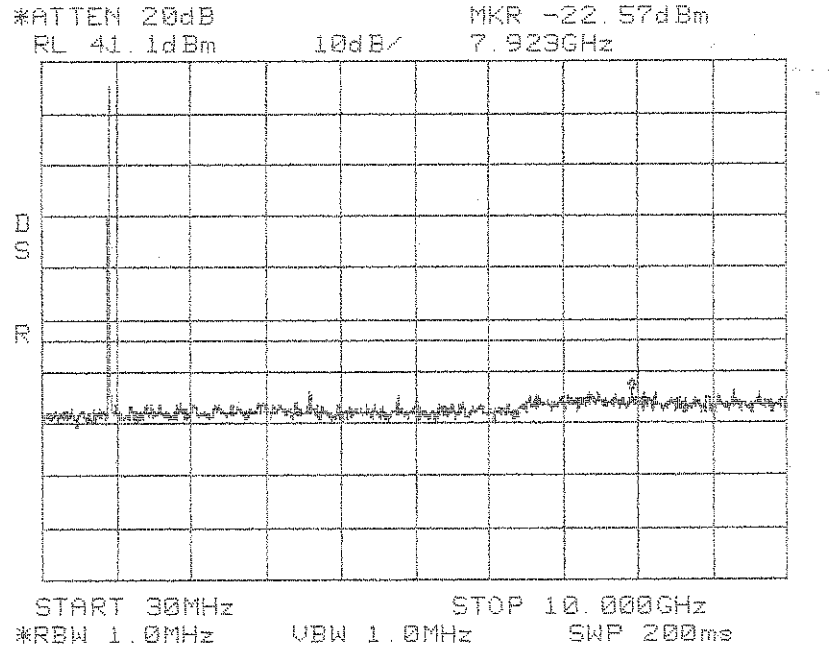
Conducted Emissions
Mid
SMR 900 MHz

Span: 30 MHz to 10 GHz
RBW/VBW: 1 MHz

Center: 937.5 MHz
Span: 15 MHz
RBW/VBW: 100 kHz



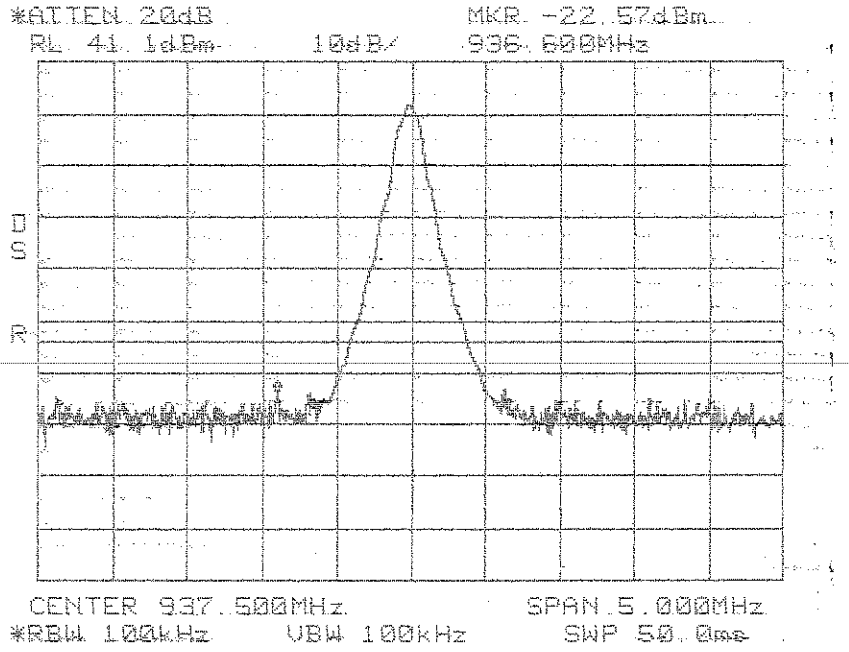
Conducted Emissions
High
SMR 900 MHz



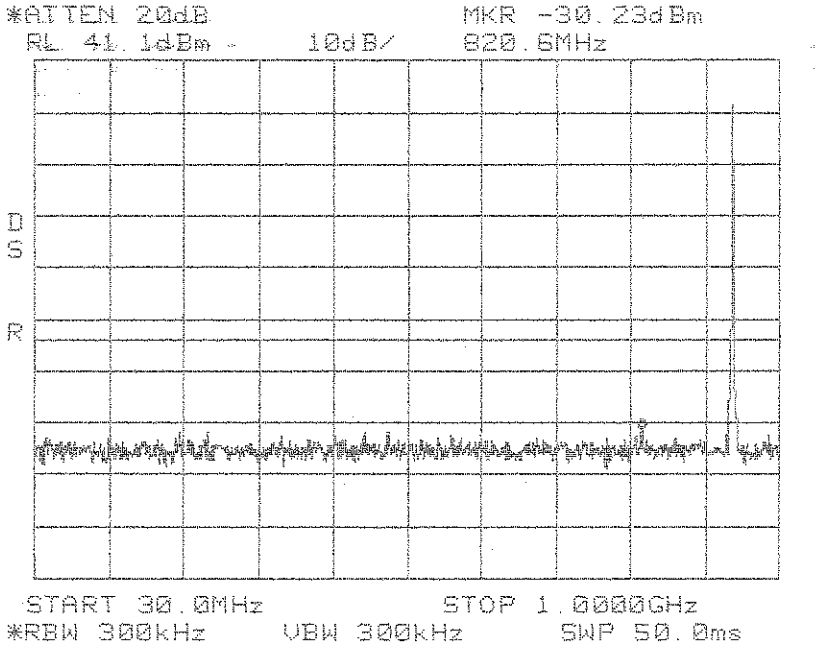
Conducted Emissions
High
SMR 900 MHz

Span: 30 MHz to 10 GHz
RBW/VBW: 1 MHz

Center: 937.5 MHz
Span: 5 MHz
RBW/VBW: 100 kHz

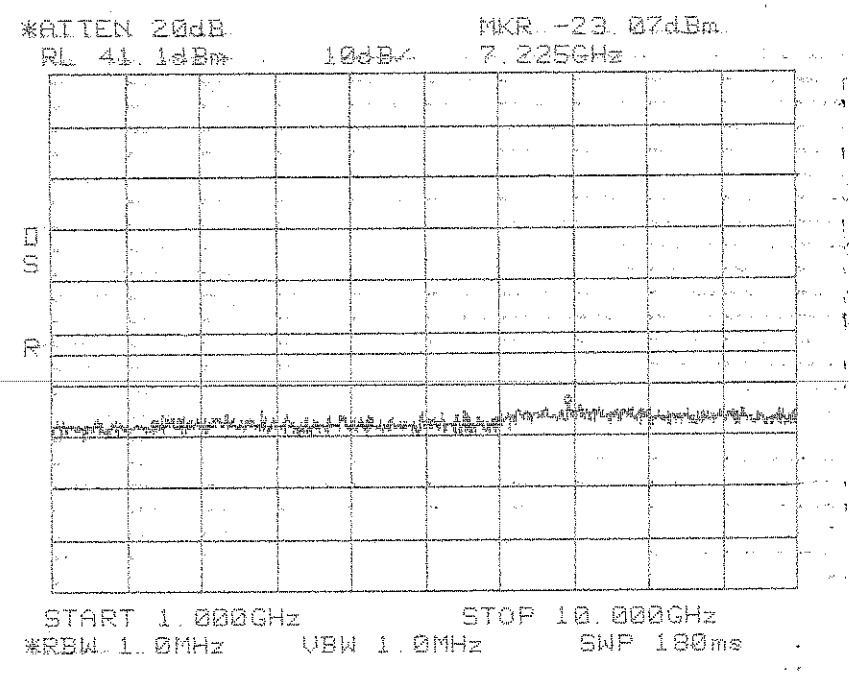


Conducted Emissions
FM
SMR 900 MHz



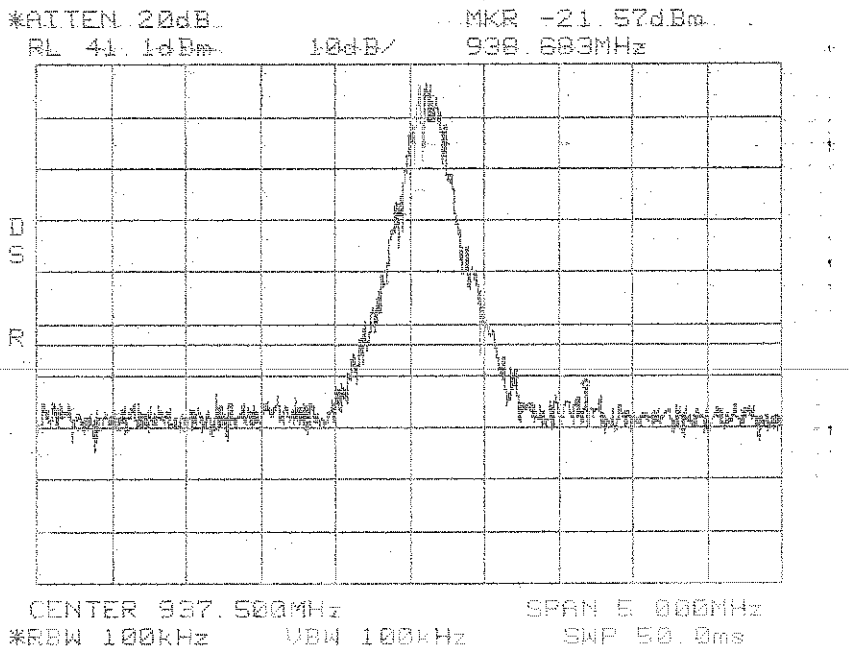
Conducted Emissions
FM
SMR 900 MHz

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

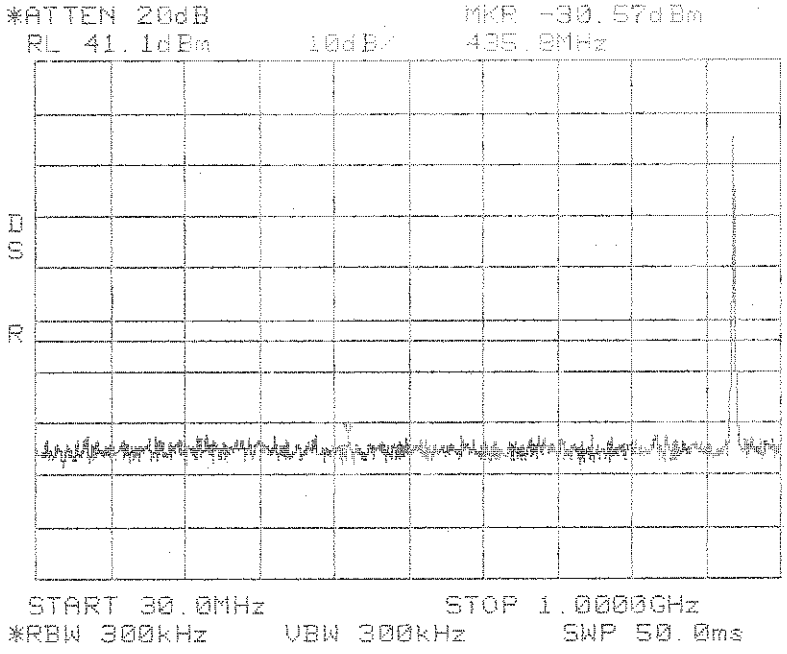


Conducted Emissions
FM
SMR 900 MHz

Center: 937.5 MHz
Span: 5 MHz
RBW/VBW: 100 kHz



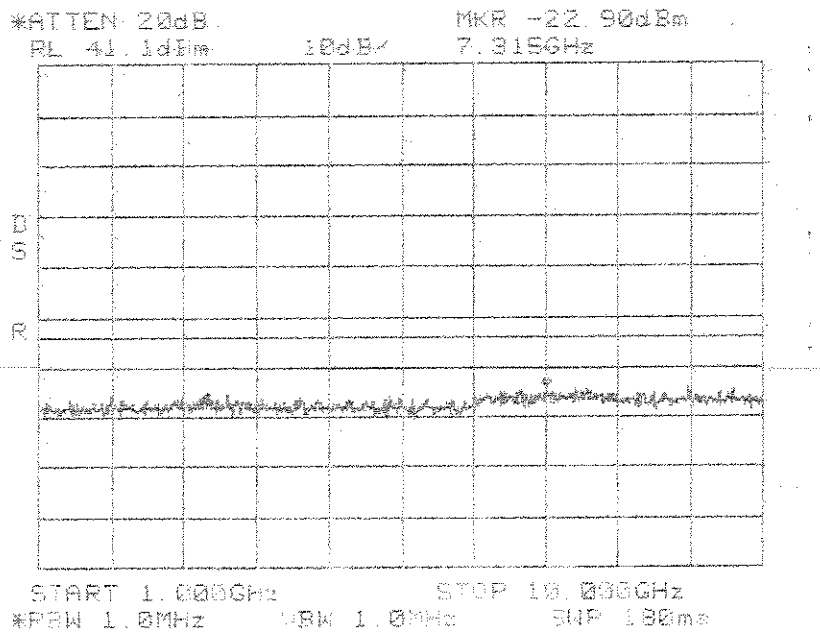
Conducted Emissions
iDEN
SMR 900 MHz



Conducted Emissions
iDEN
SMR 900 MHz

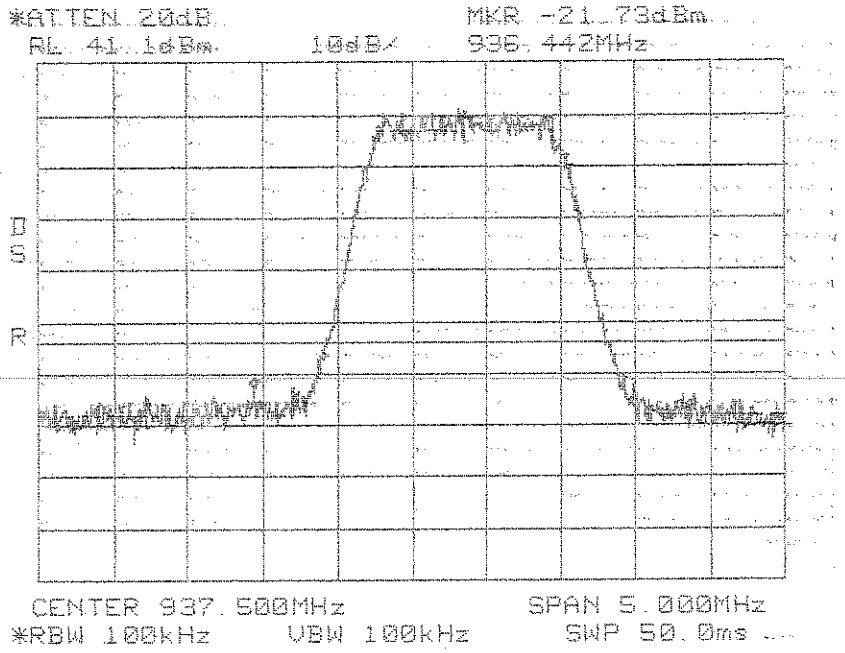
Span: 30 MHz to 1 GHz
RBW/VBW: 300 kHz

1 GHz to 10 GHz
RBW/VBW: 1 MHz

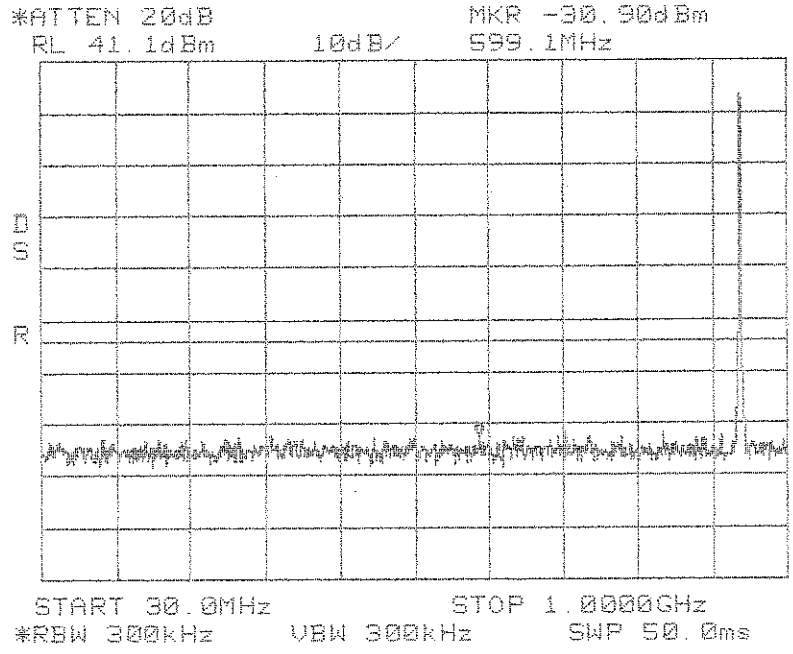


Conducted Emissions
iDEN
SMR 900 MHz

Center: 937.5 MHz
Span: 5 MHz
RBW/VBW: 100 kHz

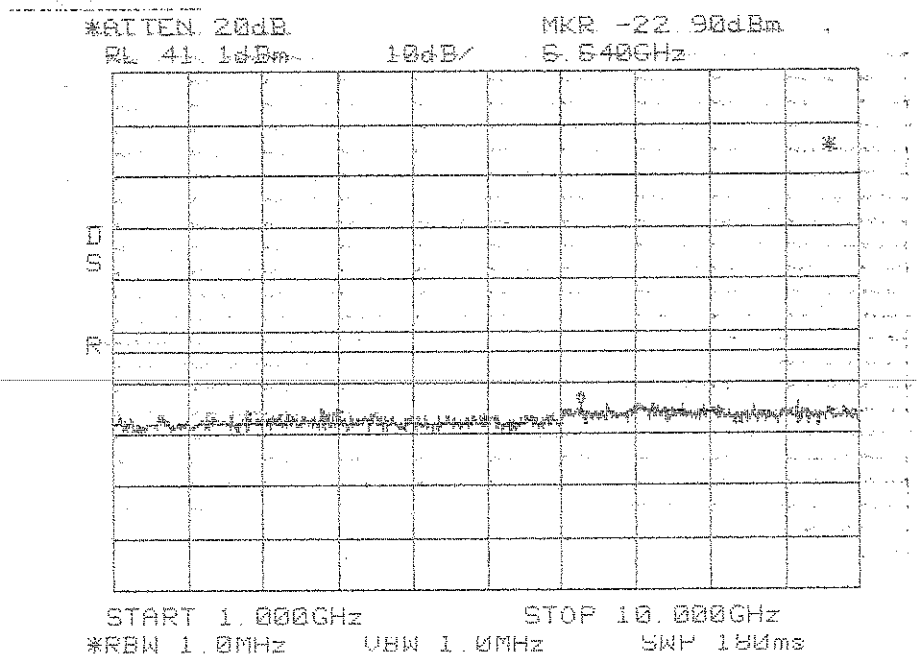


Conducted Emissions
CDMA
SMR 900 MHz



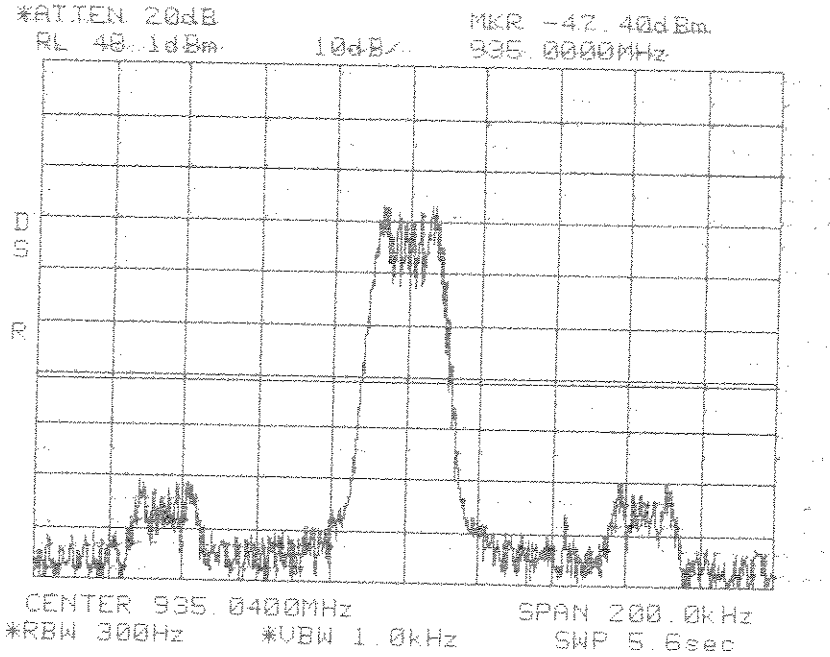
Conducted Emissions
CDMA
SMR 900 MHz

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

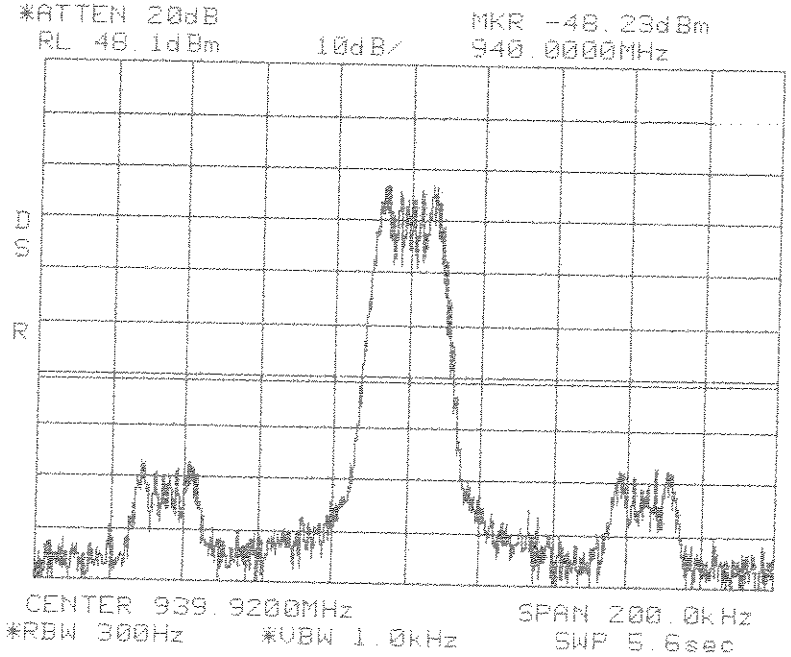


Conducted Emissions
CDMA
SMR 900 MHz

Center: 935.04 MHz
Span: 200 kHz
RBW: 300 Hz
VBW: 1 kHz



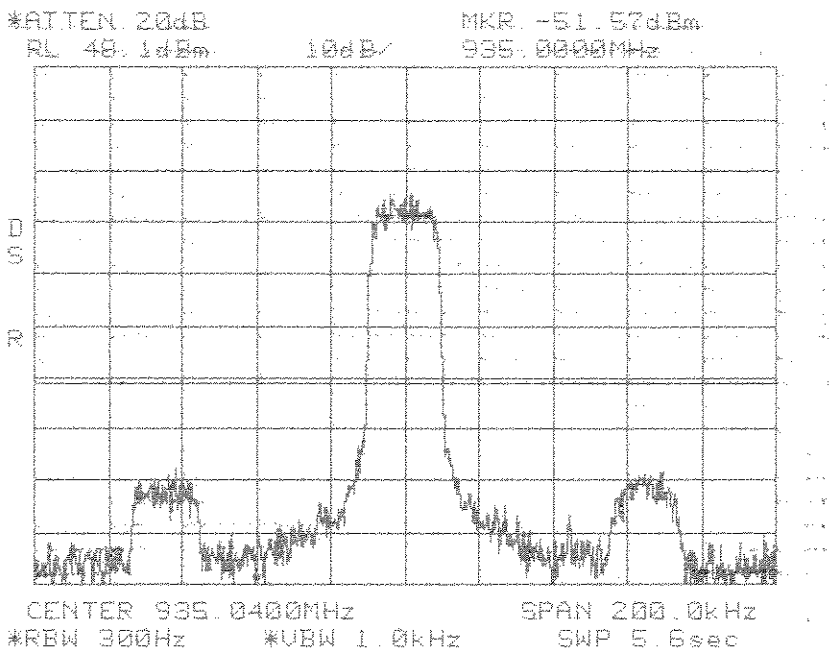
Band Edge
FM



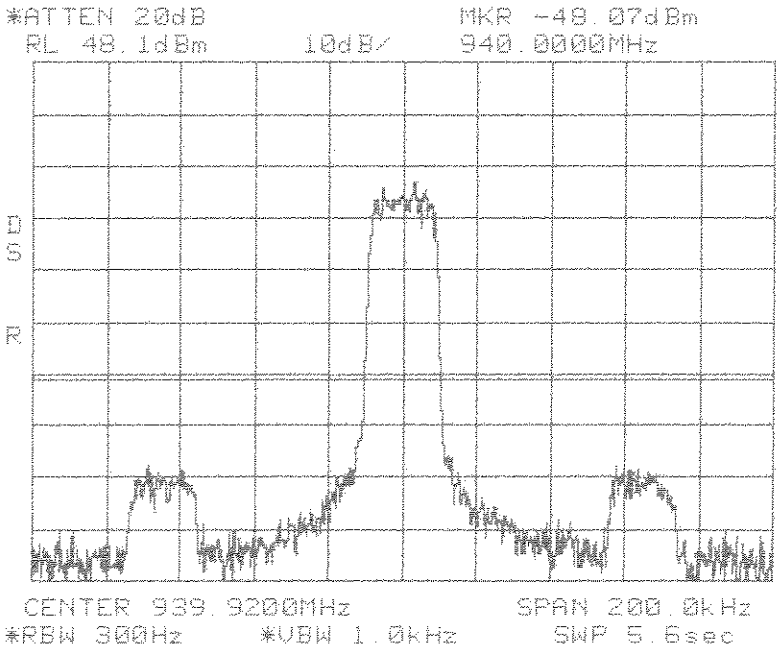
Band Edge
FM

Center: 939.92 MHz
Span: 200 kHz
RBW: 300 Hz
VBW: 1 kHz

Center: 935.04
Span: 200 kHz
RBW: 300 Hz
VBW: 1 kHz



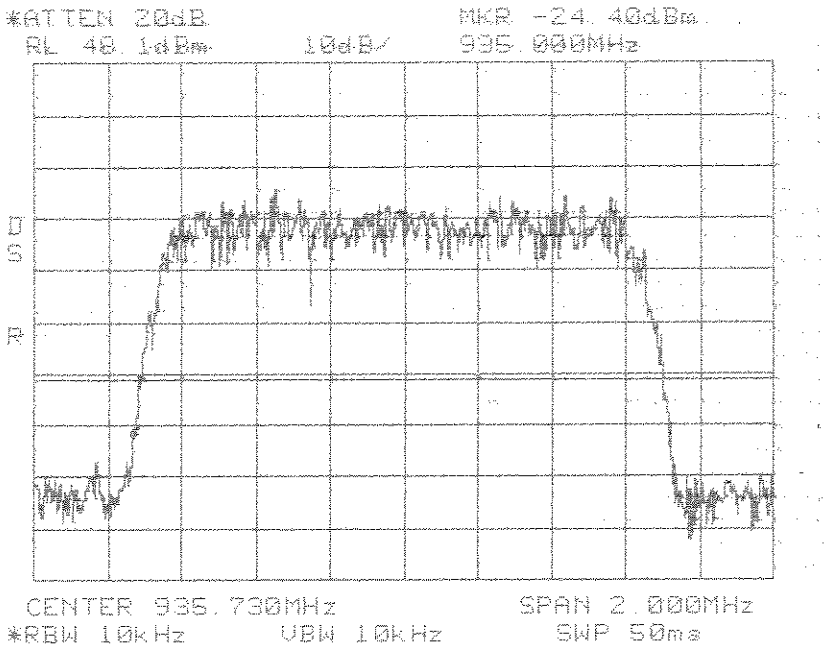
Band Edge
iDEN



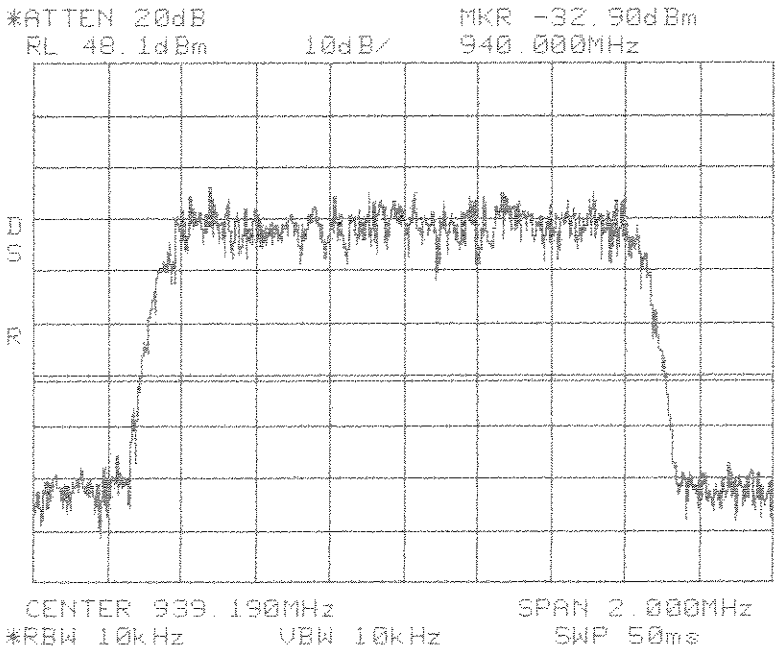
Band Edge
iDEN

Center: 939.92 MHz
Span: 200 kHz
RBW: 300 Hz
VBW: 1 kHz

Center: 935.73
Span: 2 MHz
RBW: 10 kHz
VBW: 10 kHz



Band Edge
CDMA



Band Edge
CDMA

Center: 939.19 MHz
Span: 2 MHz
RBW: 10 kHz
VBW: 10 kHz

12. EQUIVALENT ISOTROPICALLY RADIATED POWER EIRP SUBSTITUTION

This exercise, which consists of a comparison of the radiated emissions (dB/uV) in comparison to a conducted emission (dBm) measurement, to rule out the margin of error from test site calibration, was not conducted.
The EUT was about 60 – 70 dB below the allowed -13 dBm limit, therefore, the practical need for this measurement was very minimal. The following are the questions and responses from the FCC, OET Knowledge Database Site on the test requirements of EIA/TIA 603.

Response:
The requirements for measuring RF Power and radiated spurious emissions are contained in 47 CFR 2.1046 & 2.1053, respectively.

Q1) We have a question in regards to Section 2.1053 for licensed devices. When will the substitution method takes precedence over field strength measurements?
A1) Always.

Q2) To date we have performed and submitted harmonic emission compliance using a converted -13 dBm to a field strength limit at 3 meters (82.2 dBuV/m for EIRP or 84.2 dBuV/m for ERP). Again, is this still the acceptable method or is the substitution now the only preferred test method?
A2) For consistency, the FCC is requesting everybody to use the substitution method. However, when the initial measured field strength levels of the spurious emissions are more than 20 dB below the above-cited levels, then continuation with the substitution method is not necessary.

Q3) In regards to power output measurements, due to high power license devices (e.g., 2 watts and higher) some signal generators cannot generate those types of field strength, for a substitution test. This is where we use the field strength, which is then converted to a power level. Is this an acceptable alternative test method?
A3) No, if you are attempting to duplicate a field strength reference reading that is higher than possible with the signal generator (and a dipole antenna), then you may run the signal generator at a lower level and then add the dB difference to the output. For example, to simulate a xx dBuV/m field strength reference reading, you may generate a duplicate field strength of xx/10 dBuV/m, and then add 10 db to the signal generator output to determine the proper replacement (substitution) level. Similarly, if the replacement antenna used with the signal generator is not a dipole but provides gain, then you should add the dB gain! of the antenna (referenced to a dipole) to obtain the proper replacement (substitution) signal generator output.

13. Radiated Emissions (30 MHz to 1 GHz) Test

13.1. Regulatory Limit: (Peak)

Frequency Range (MHz)	Distance (Meters)	Limit (dBµV/m)
30 to 1000	3	94 (-13 dBm)

13.2. Measurement Equipment Used to Perform Test

Device	Manufacturer	Model No.	Serial No.	Last Cal	Cal Due
EMI Receiver	Hewlett Packard	8546A	3650A00360	1/5/2005	1/5/2007
Biconilog Antenna	Com-Power	AC220	25509	1/31/2006	1/31/2007

13.3. Measurement & Equipment Setup

Test Date:	10/11/2006
Test Engineer:	Robert J. McCall
Site Temperature (°C):	21.6
Relative Humidity (%RH):	35
Frequency Range:	30 MHz to 1 GHz
Measurement Distance:	3 Meters
EMI Receiver IF Bandwidth:	120 kHz
EMI Receiver Avg Bandwidth:	300 kHz
Detector Functions:	Peak
Antenna Height:	1 to 4 meters

13.4. 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.

13. Radiated Emissions (30 MHz to 1 GHz) Test (continued)

13.5. Radiated Emissions (30 MHz to 1 GHz) Test Results

13.5.1. Horizontal Polarity

Frequency (MHz)	Pk Amp (dBµV/m)	QP Amp (dBµV/m)	QP Limit (dBµV/m)	Margin (dB)	Ant Ht (cm)	Table (Deg)	Comments
257.4651	27.59	25.12	94.00	-68.88	N/A	N/A	
300.4305	21.81	15.21	94.00	-78.79	N/A	N/A	
343.2948	31.24	29.59	94.00	-64.41	N/A	N/A	
386.2449	23.61	19.78	94.00	-74.22	N/A	N/A	
429.1134	36.91	35.77	94.00	-58.23	N/A	N/A	
557.8576	25.33	21.88	94.00	-72.12	N/A	N/A	
660.9489	28.34	24.59	94.00	-69.41	N/A	N/A	
766.9982	28.37	22.28	94.00	-71.72	N/A	N/A	
777.5856	30.16	26.50	94.00	-67.50	N/A	N/A	
816.4763	26.90	21.10	94.00	-72.90	N/A	N/A	
833.6559	27.88	21.58	94.00	-72.42	N/A	N/A	
841.9802	27.30	21.50	94.00	-72.50	N/A	N/A	
900.3756	28.51	22.61	94.00	-71.39	N/A	N/A	
900.8210	28.71	22.20	94.00	-71.80	N/A	N/A	
901.1879	29.92	24.11	94.00	-69.89	N/A	N/A	
906.1899	28.29	22.09	94.00	-71.91	N/A	N/A	
933.6703	30.64	25.90	94.00	-68.10	N/A	N/A	

13.5.2. Vertical Polarity

Frequency (MHz)	Pk Amp (dBµV/m)	QP Amp (dBµV/m)	QP Limit (dBµV/m)	Margin (dB)	Ant Ht (cm)	Table (Deg)	Comments
257.4651	28.43	26.46	94.00	-67.54	N/A	N/A	
300.4305	18.48	13.45	94.00	-80.55	N/A	N/A	
343.3002	28.17	25.66	94.00	-68.34	N/A	N/A	
386.2449	22.42	19.34	94.00	-74.66	N/A	N/A	
429.1254	28.86	27.64	94.00	-66.36	N/A	N/A	
451.2978	20.09	15.25	94.00	-78.75	N/A	N/A	
777.5856	29.23	24.83	94.00	-69.17	N/A	N/A	
833.6559	29.14	23.40	94.00	-70.60	N/A	N/A	
906.1899	28.37	22.55	94.00	-71.45	N/A	N/A	
933.6703	28.46	22.41	94.00	-71.59	N/A	N/A	

14. Radiated Emissions (> 1 GHz) Test

14.1. Regulatory Limit: (Peak)

Frequency Range (GHz)	Distance (Meters)	Peak Limit (dBµV/m)
1 to 10	3	94 (-13 dBm)

14.2. Measurement Equipment Used to Perform Test

Device	Manufacturer	Model No.	Serial No.	Last Cal	Cal Due
EMI Receiver	Hewlett Packard	8546A	3650A00360	1/5/2005	1/5/2007
Biconilog Antenna	Com-Power	AC220	25509	1/31/2006	1/31/2007

14.3. Measurement & Equipment Setup

Test Date:	10/042006
Test Engineer:	Brian Breault
Site Temperature (°C):	21.6
Relative Humidity (%RH):	35
Frequency Range:	Above 1 GHz
Measurement Distance:	3 Meters
EMI Receiver IF Bandwidth:	1 MHz
EMI Receiver Avg Bandwidth:	3 MHz
Detector Functions:	Peak
Antenna Height:	1 to 4 meters

14.4. 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.

9. Radiated Emissions (>1 GHz) Test (continued)

9.5. Radiated Emissions (> 1 GHz) Test Results

Temperature:	21.6 °C	**Test Number:**	277-06
Humidity:	35 %	**Engineer:**	Brian Breault
Company:	ADC	**Test Date:**	10/04/06
Product:	Base Station	**Test Distance:**	3 Meters

Test Standard (details): Custom limit requested by client.

Test Data:

Frequency MHz	Reading dBµV/m	Limit dBµV/m	Polarity H/V	Ant. Ht. cm	Table Pos. Degrees	Detector P/QP/A	Note
3095.000	43.99	94	H	140	0	P	
4555.000	45.79	94	H	100	0	P	
5405.000	47.41	94	H	100	0	P	
6083.880	53.53	94	H	198	90	P	
7960.000	56.97	94	H	198	0	P	

Compliance Worldwide, Inc. - 357 Main Street - Sandown, NH 03873
(603) 887 3903 Fax 887 6445
http://www.cw-inc.com

9. Radiated Emissions (>1 GHz) Test (continued)

9.5. Radiated Emissions (> 1 GHz) Test Results

Temperature:	21.6 °C	**Test Number:**	277-06
Humidity:	35 %	**Engineer:**	Brian Breault
Company:	ADC	**Test Date:**	10/04/06
Product:	Base Station	**Test Distance:**	3 Meters

Test Standard (details): Custom limit requested by client.

Test Data:

Frequency MHz	Reading dBµV/m	Limit dBµV/m	Polarity H/V	Ant. Ht. cm	Table Pos. Degrees	Detector P/QP/A	Note
3095.000	43.99	94	H	140	0	P	
4555.000	45.79	94	H	100	0	P	
5405.000	47.41	94	H	100	0	P	
6083.880	53.53	94	H	198	90	P	
7960.000	56.97	94	H	198	0	P	

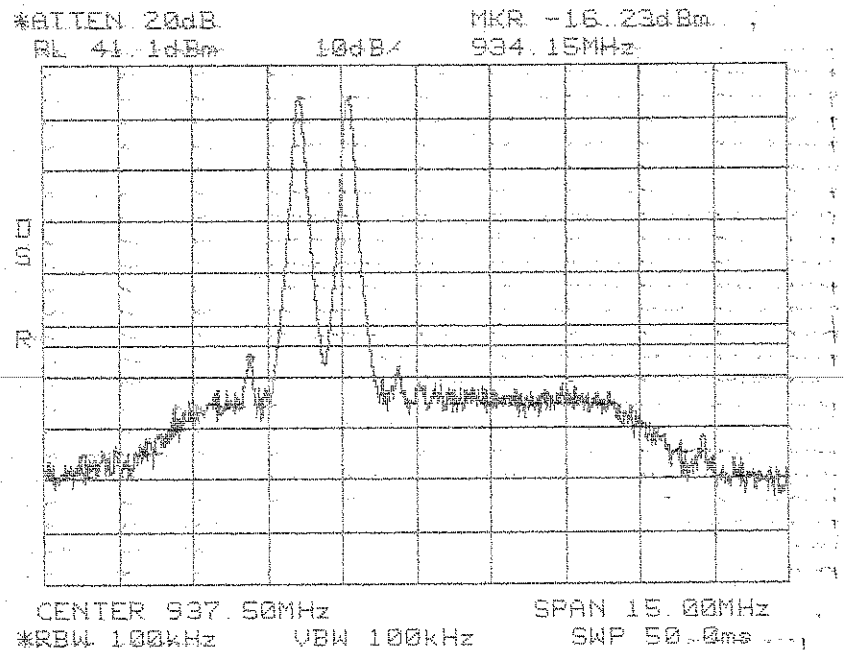
Compliance Worldwide, Inc. - 357 Main Street - Sandown, NH 03873
(603) 887 3903 Fax 887 6445
http://www.cw-inc.com

Inter-Modulation Test for ADC Inc
Digivance® NXD SMR 900 MHz
Model Number DGVN-0200000011NRN

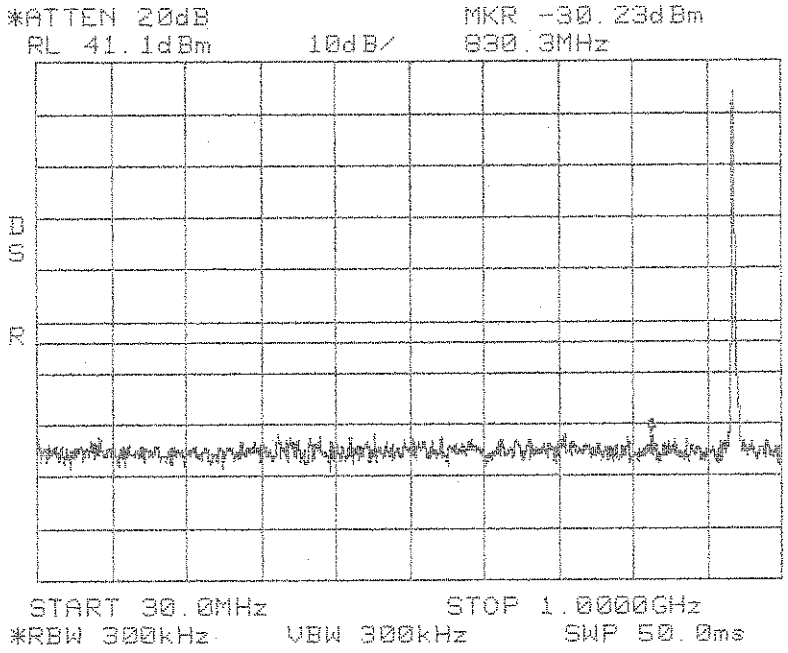
The inter-modulation products test was performed for the EUT. Three tests were preformed with the modulation type. Test 1 was with 2 signals input to the EUT at lower end channels. Test 2 was with 2 signals input to the EUT at upper end channels. Test 3 was with 2 signals input to the EUT at upper and lower end channels. The modulation types tested were FM, iDEN, and CDMA. An investigation was made from 30 MHz to the 10^{th} Harmonic of the highest fundamental frequency (~10 GHz). The following plots show the results.

Results:
(See Plots)

Center: 937.5 MHz
Span: 15 MHz
RBW/VBW: 100 kHz



Intermodulation
Close
Lower
FM
SMR 900 MHz

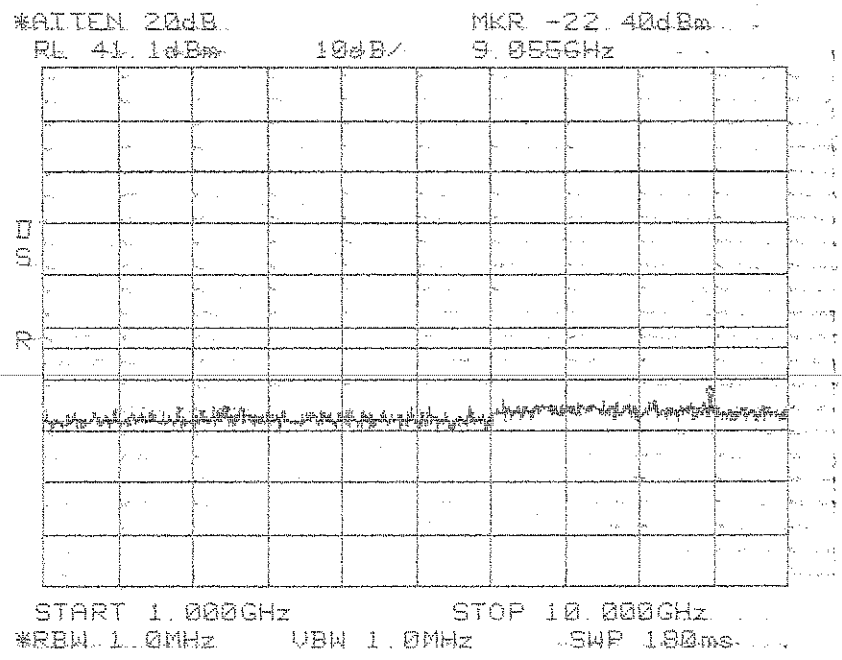


Intermodulation
Close
Lower
FM
SMR 900 MHz

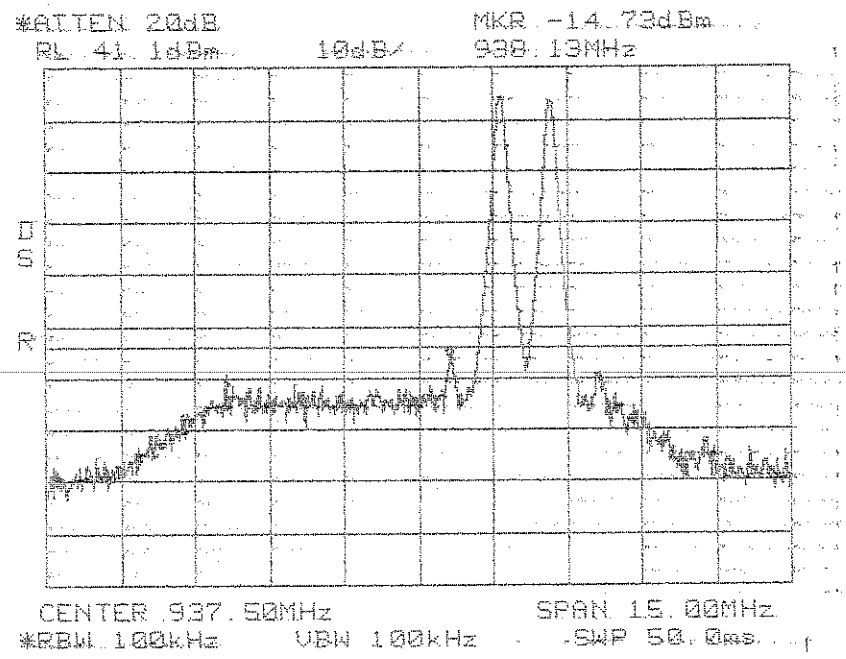
Span: 30 MHz to 1 GHz
RBW/VBW: 300 kHz

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

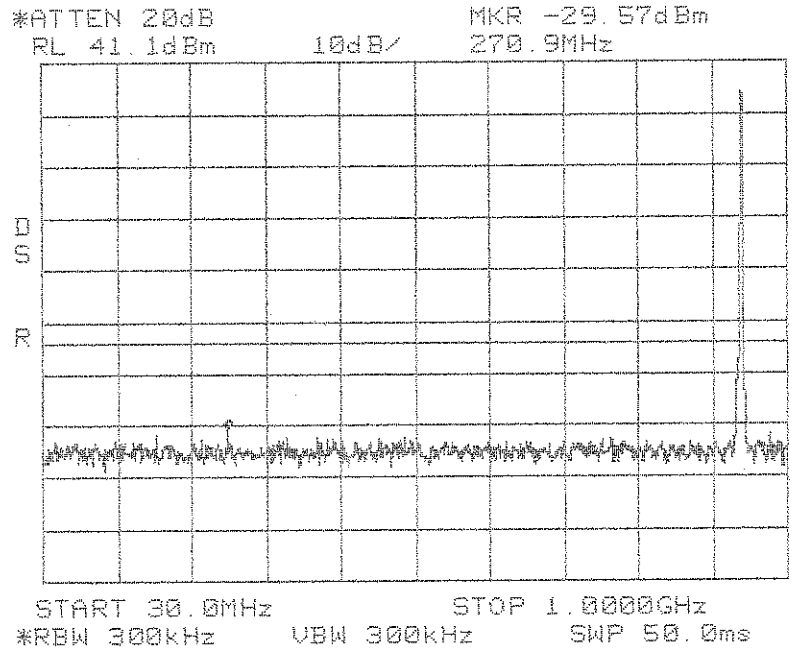
Intermodulation
Close
Lower
FM
SMR 900 MHz



Center: 937.5 MHz
Span: 15 MHz
RBW/VBW: 100 kHz



Intermodulation
Close
Upper
FM
SMR 900 MHz

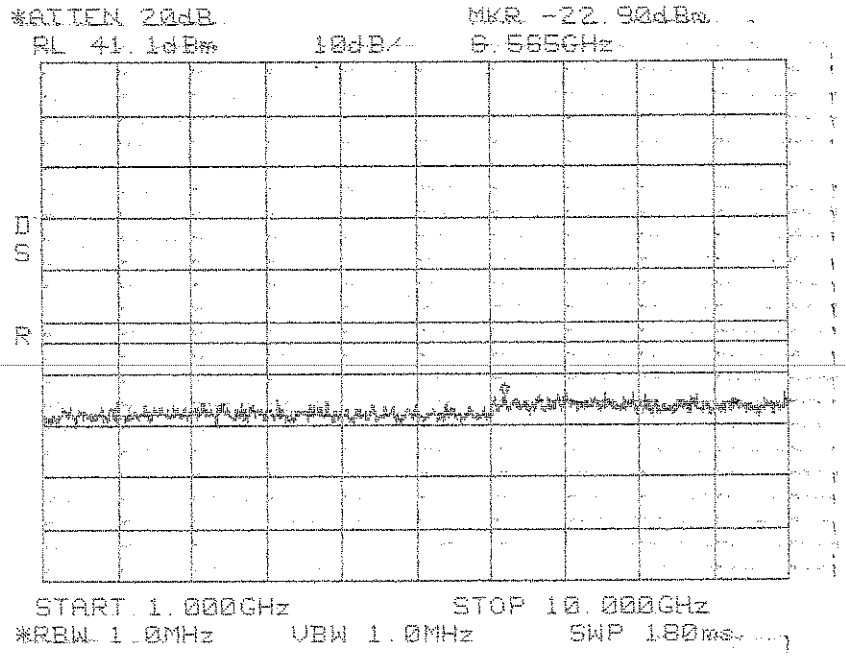


Intermodulation
Close
Upper
FM
SMR 900 MHz

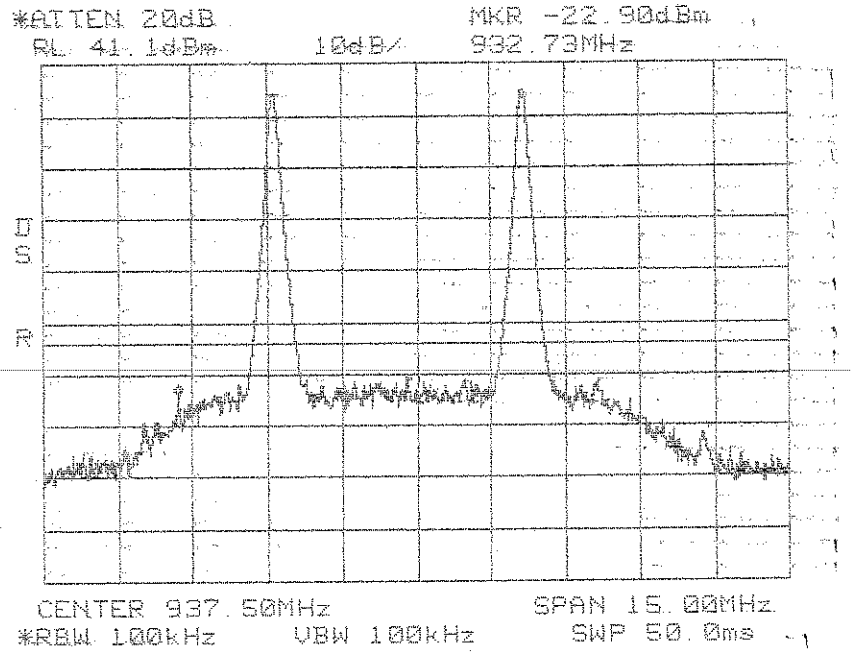
Span: 30 MHz to 1 GHz
RBW/VBW: 300 kHz

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

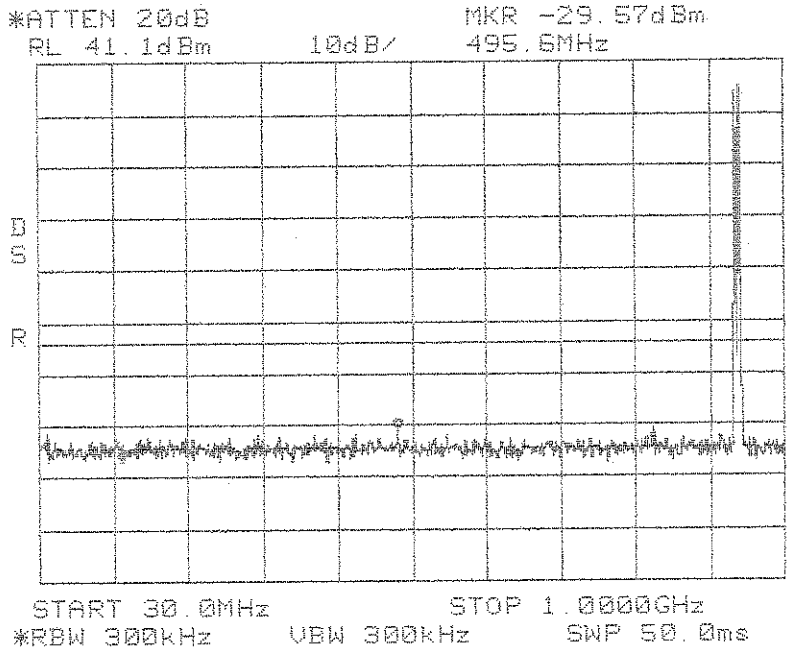
Intermodulation
Close
Upper
FM
SMR 900 MHz



Center: 937.5 MHz
Span: 15 MHz
RBW/VBW: 100 kHz



Intermodulation
Apart
FM
SMR 900 MHz

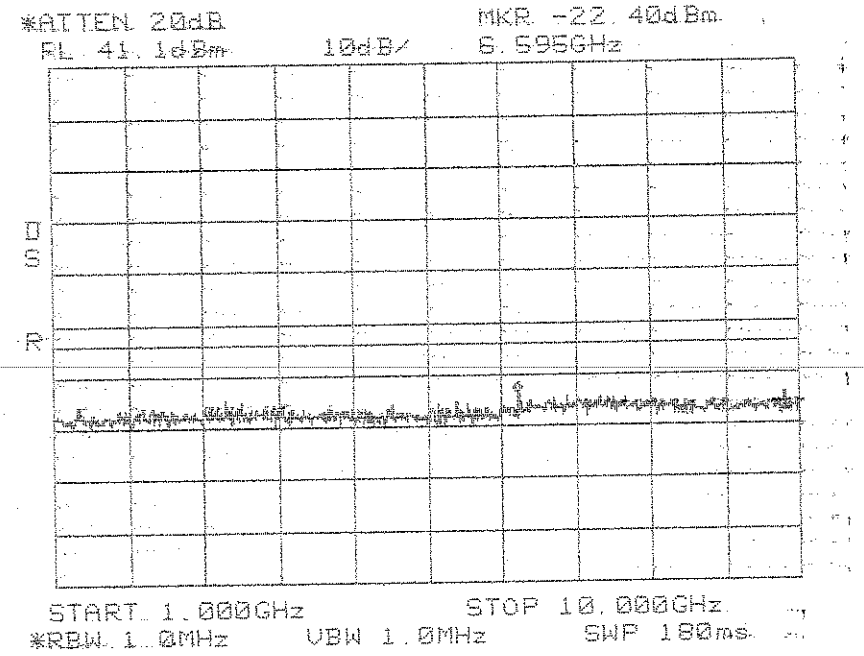


Intermodulation
Apart
FM
SMR 900 MHz

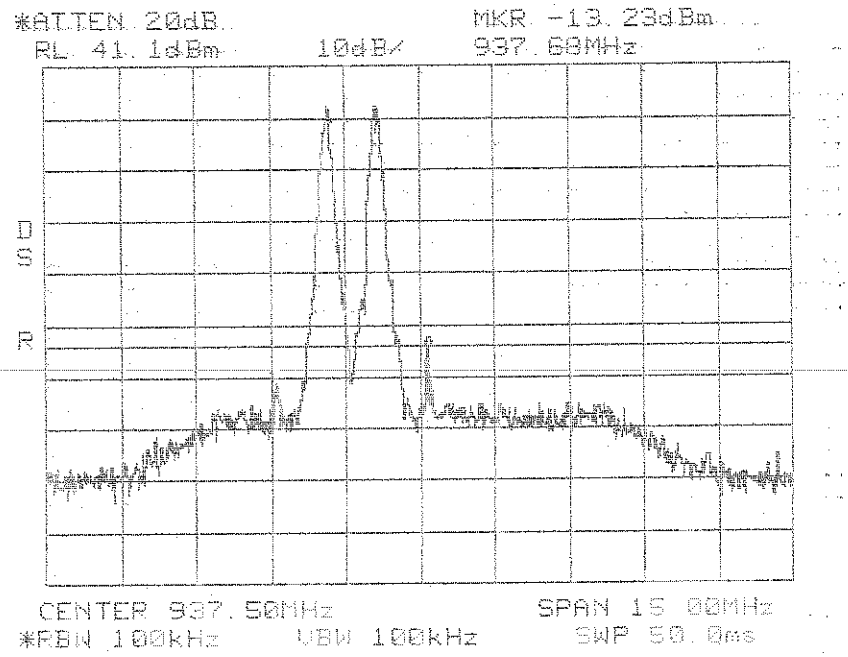
Span: 30 MHz to 1 GHz
RBW/VBW: 300 kHz

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

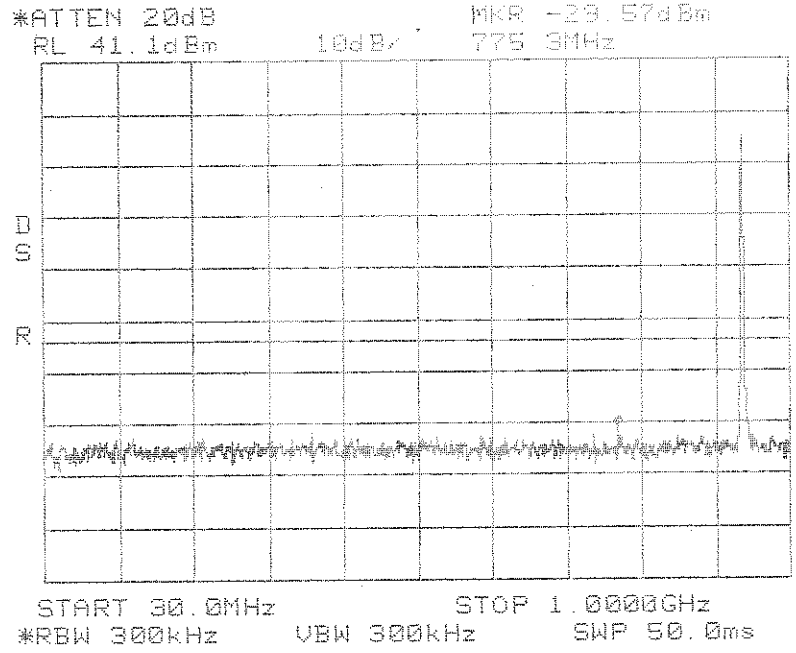
Intermodulation
Apart
FM
SMR 900 MHz



Center: 937.5 MHz
Span: 15 MHz
RBW/VBW: 100 kHz



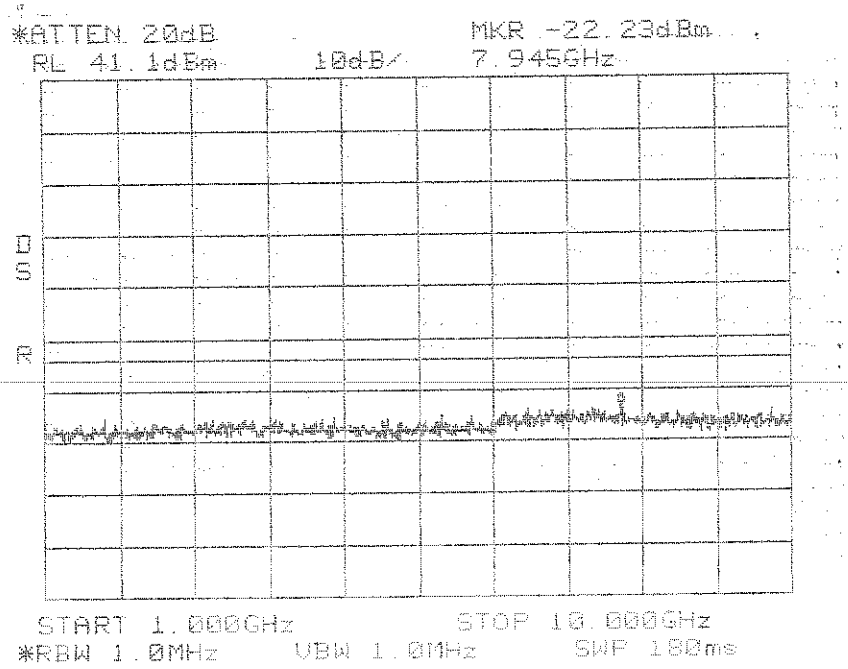
Intermodulation
Close
Lower
iDEN
SMR 900 MHz



Intermodulation
Close
Lower
iDEN
SMR 900 MHz

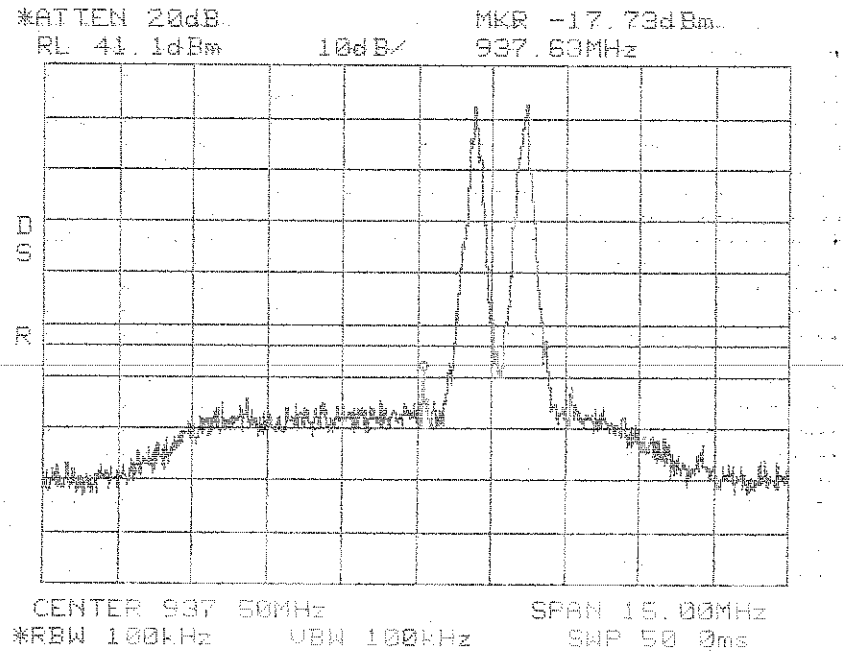
Span: 30 MHz to 1 GHz
RBW/VBW: 300 kHz

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

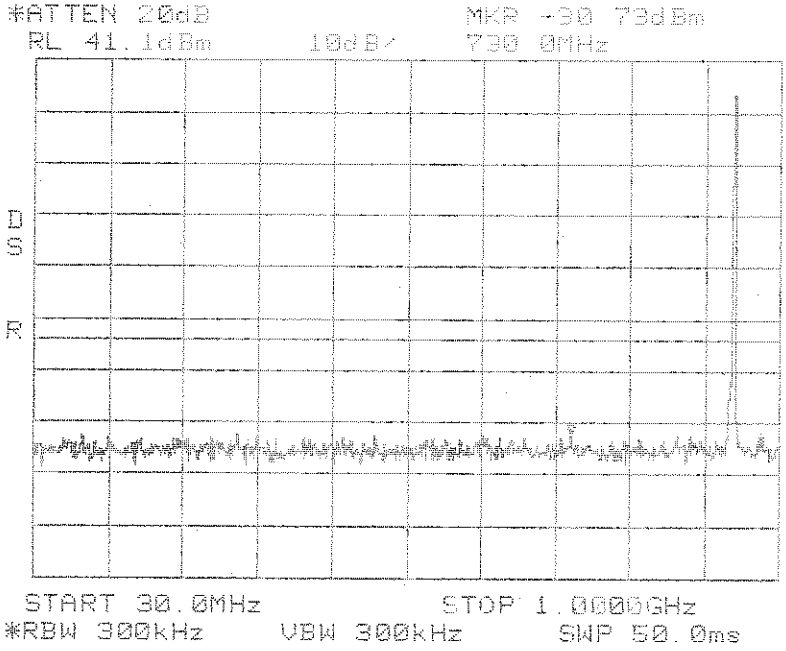


Intermodulation
Close
Lower
iDEN
SMR 900 MHz

Center: 937.5 MHz
Span: 15 MHz
RBW/VBW: 100 kHz



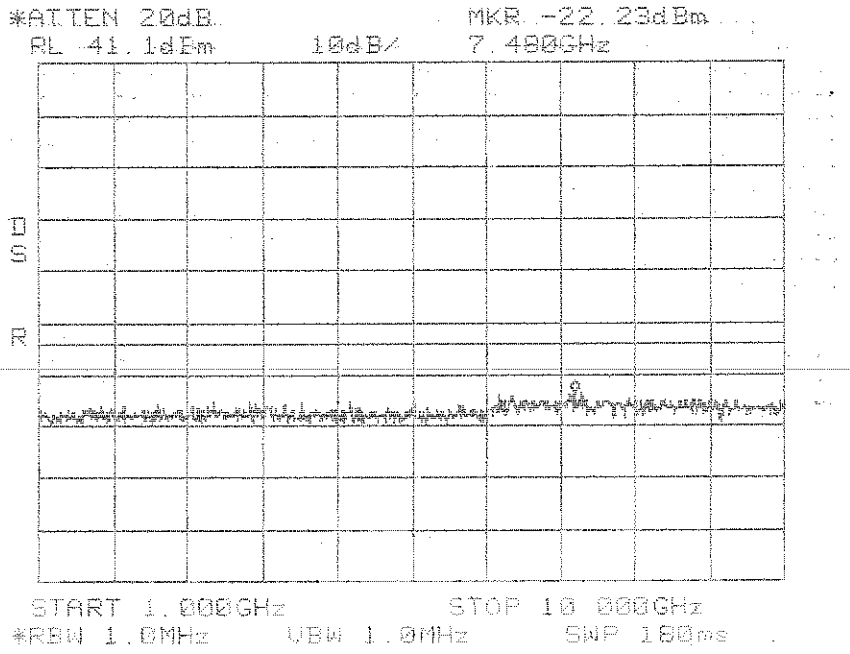
Intermodulation
Close
Upper
iDEN
SMR 900 MHz



Intermodulation
Close
Upper
iDEN
SMR 900 MHz

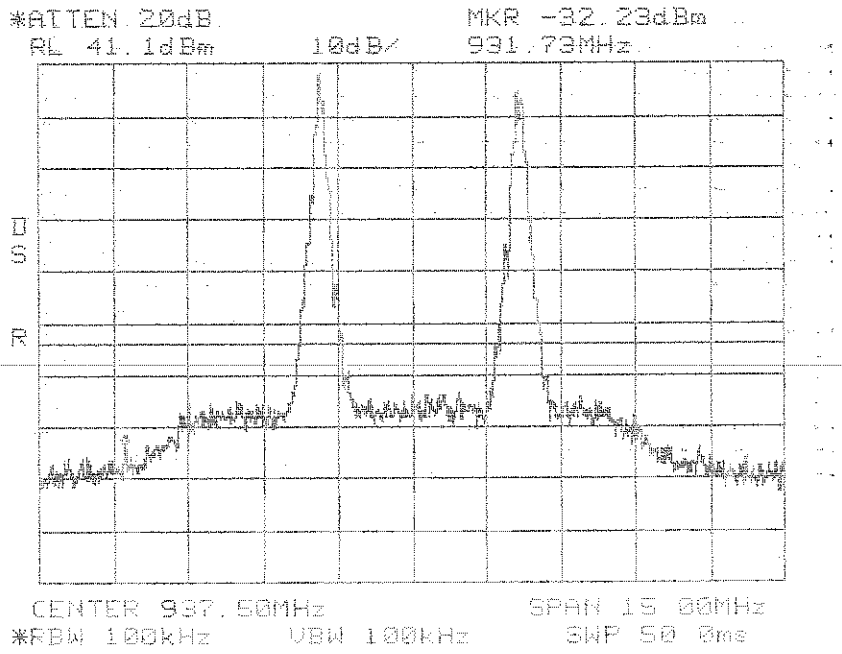
Span: 30 MHz to 1 GHz
RBW/VBW: 300 kHz

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

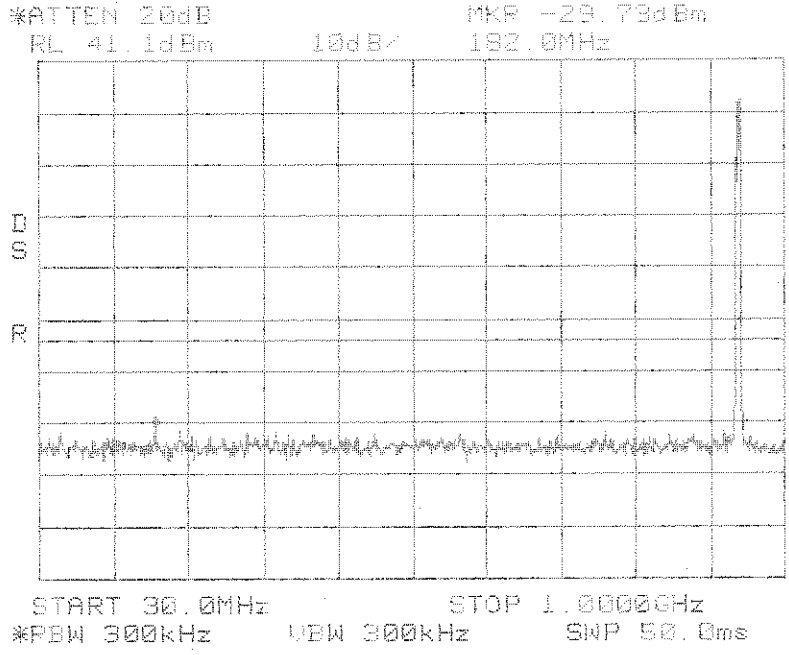


Intermodulation
Close
Upper
iDEN
SMR 900 MHz

Center: 937.5 MHz
Span: 15 MHz
RBW/VBW: 100 kHz



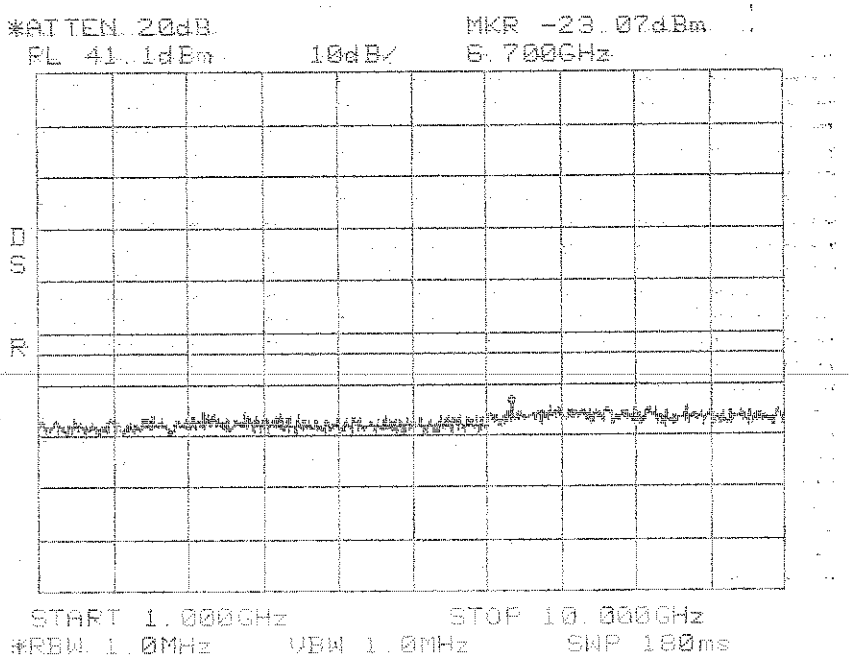
Intermodulation
Apart
iDEN
SMR 900 MHz



Intermodulation
Apart
iDEN
SMR 900 MHz

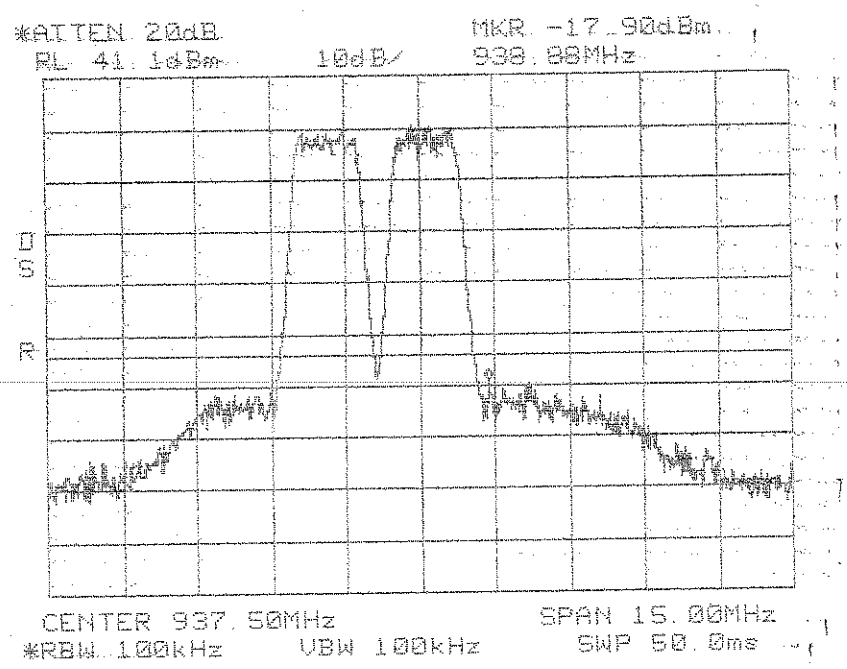
Span: 30 MHz to 1 GHz
RBW/VBW: 300 kHz

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

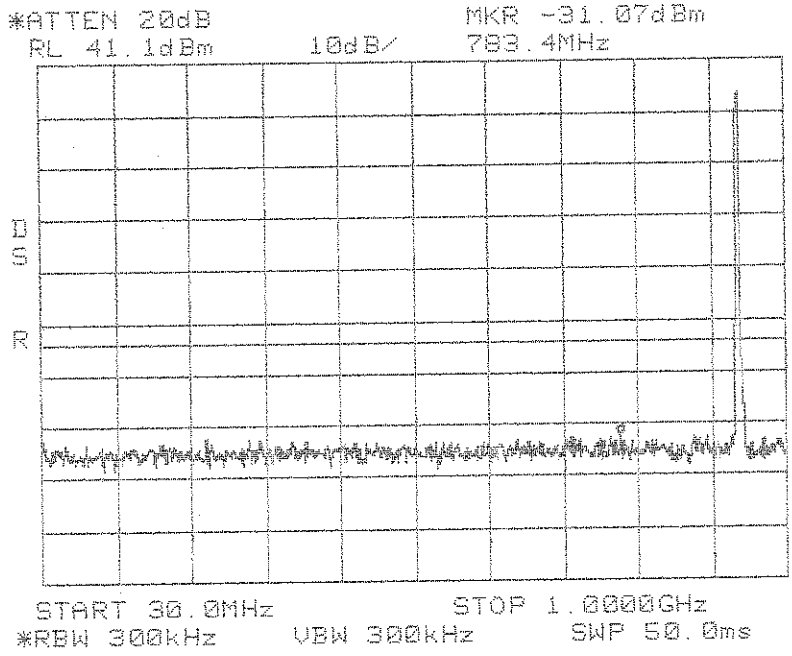


Intermodulation
Apart
iDEN
SMR 900 MHz

Center: 937.5 MHz
Span: 15 MHz
RBW/VBW: 100 kHz



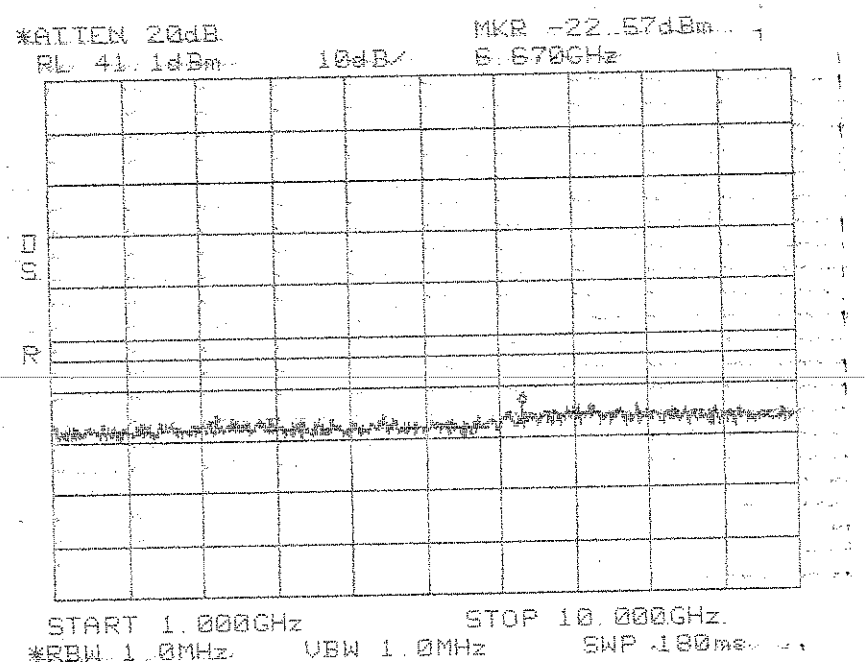
Intermodulation
Close
Lower
CDMA
SMR 900 MHz



Intermodulation
Close
Lower
CDMA
SMR 900 MHz

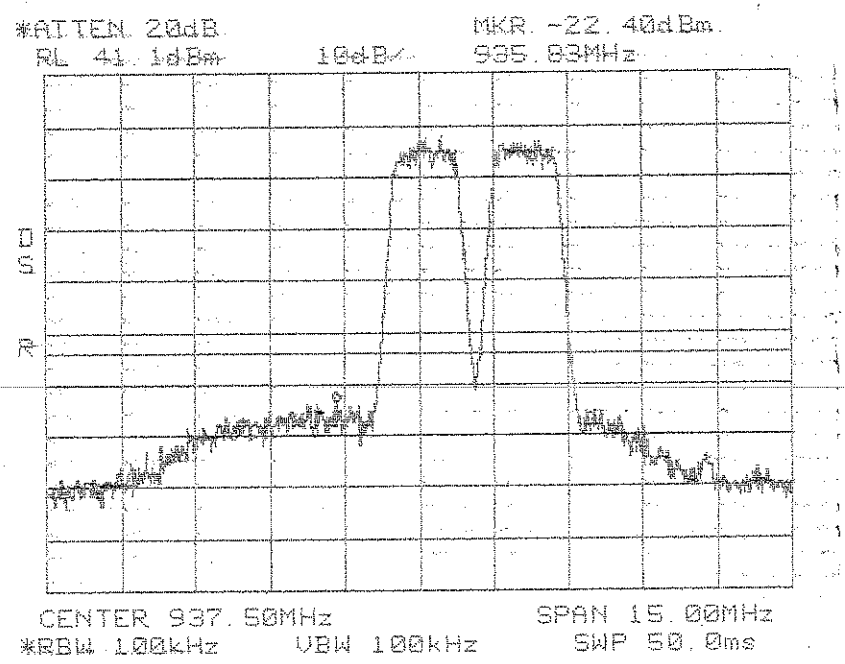
Span: 30 MHz to 1 GHz
RBW/VBW: 300 kHz

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

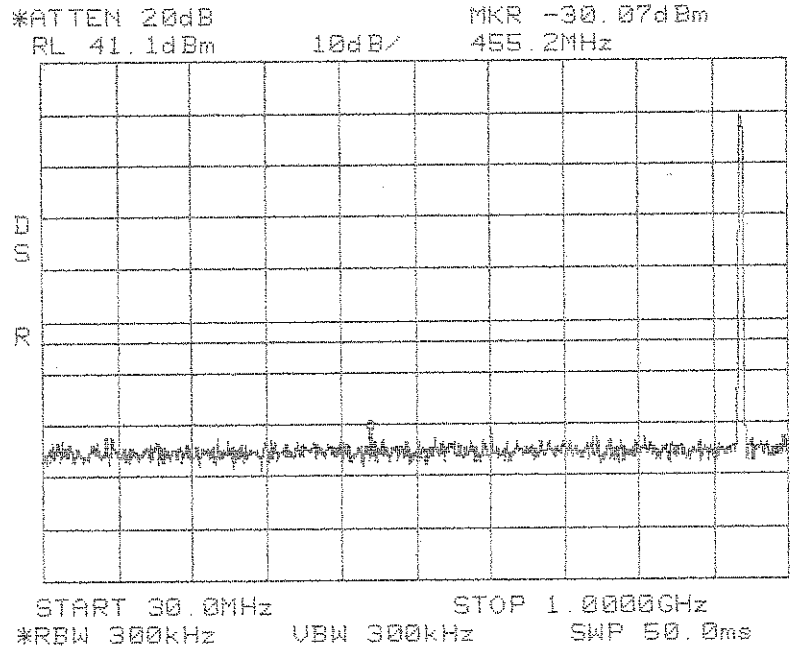


Intermodulation
Close
Lower
CDMA
SMR 900 MHz

Center: 937.5 MHz
Span: 15 MHz
RBW/VBW: 100 kHz



Intermodulation
Close
Upper
CDMA
SMR 900 MHz

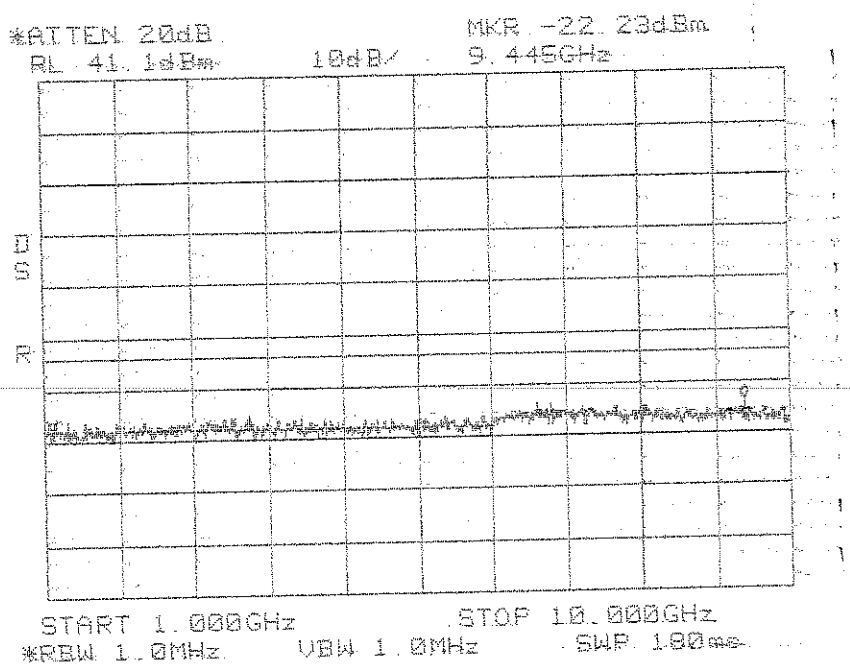


Intermodulation
Close
Upper
CDMA
SMR 900 MHz

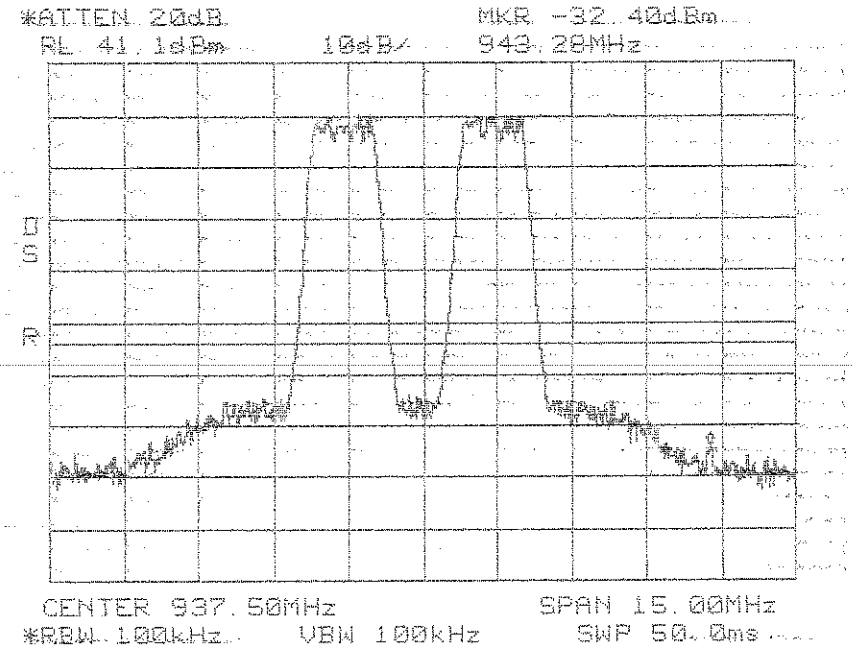
Span: 30 MHz to 1 GHz
RBW/VBW: 300 kHz

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

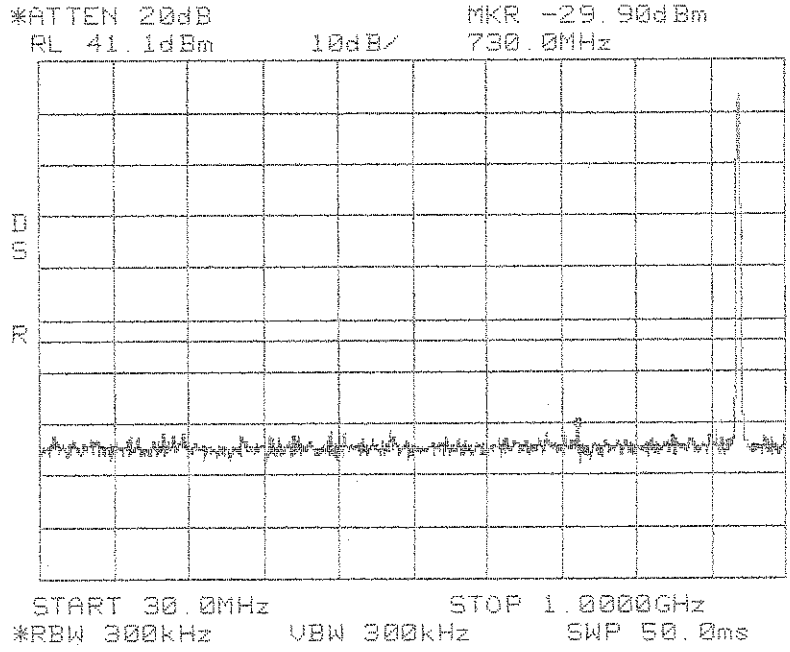
Intermodulation
Close
Upper
CDMA
SMR 900 MHz



Center: 937.5 MHz
Span: 15 MHz
RBW/VBW: 100 kHz



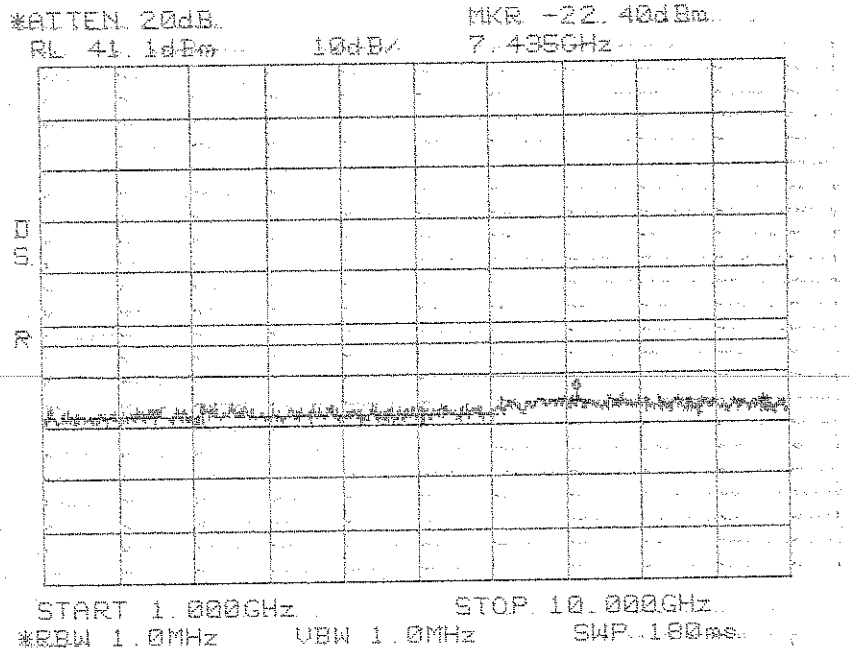
Intermodulation
Apart
CDMA
SMR 900 MHz



Intermodulation
Apart
CDMA
SMR 900 MHz

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

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



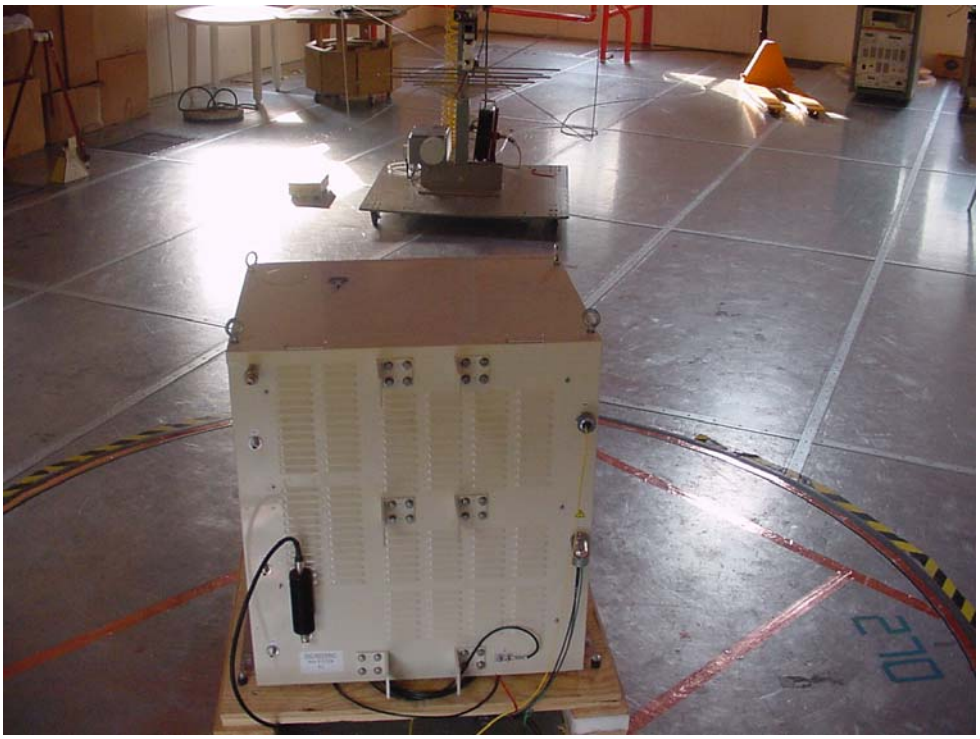
Intermodulation
Apart
CDMA
SMR 900 MHz

16. Test Images

16.1. Radiated Emissions, Front View

16. Test Images (continued)

16.2. Radiated Emissions, Rear View



17. Test Site Description

Compliance Worldwide is located at 357 Main Street in Sandown, New Hampshire. The test sites at Compliance Worldwide are used for conducted and radiated emissions testing in accordance with Federal Communications Commission (FCC), Industry Canada, and Voluntary Control Council Interference (VCCI) standards. A description of the test sites is on file with the FCC (registration number 96392), Industry Canada (file number IC 3023), and VCCI (member number 2147, registration numbers C-1987 and R-1856.

The radiated emissions test site is a 3 and 10 meter enclosed open area test site (OATS). Personnel, support equipment and test equipment are located in the basement beneath the OATS ground plane.

The conducted emissions site is part of a 16' x 20' x 12' ferrite tile chamber and uses one of the walls for the vertical ground plane required by EN 55022.

Both sites are designed to test products or systems 1.5 meters W x 1.5 meters L x 2.0 meters H, floor standing or table top.

18. Test Summary

18.1. Client Information:

- **Name:** ADC Telecommunications, Inc.
- **Address:** P.O. Box 1101
  Minneapolis, MN 55440-1101
- **Telephone:** (952) 403-8340

18.2. Product Information:

- **Product:** Digivance NXD SMR 900 MHz
- **Model Number:** DGVN-0200000011NRN
- **Serial Number:** N/A
- **Description:** Transports RF between a remote antenna and base station
- **Power Requirements:** 120 V, 60 Hz (4.4 A)
- **EMC Modifications:** None

18.3. Regulatory Standards:

- **CFR Title 47 FCC Part 90**

18.4. Conclusion:

The product sample met the regulatory standards with the following modification(s): None