Application for Certification
For an RF Power Amplifier

Paradigm Wireless Systems Inc.
1672 McGaw Ave.
Irvine, CA 92614

RF Power Amplifier:
Part # MAF900-60S
FCC ID: OQ3MAF900-60S

REPORT # RA055024/20061

Prepared By:
Fred Gurule

DNB Engineering, Inc.
3535 W. Commonwealth Ave.
Fullerton, CA 92833

OCTOBER 24 2001

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1.0 ADMINISTRATIVE DATA

1.1 Certifications and Qualifications

I certify that DNB Engineering, Inc conducted the tests performed in order to obtain the technical data presented in this application. Also, based on the results of the enclosed data, I have concluded that the equipment tested meets or exceeds the requirements of the Rules and Regulations governing this application.

1.2 Measurement Repeatability Information

The test data presented in this report has been acquired using the guidelines set forth in FCC Part 2.1031 through 2.1057, Part 90. The test results presented in this document are valid only for the equipment identified herein under the test conditions described. Repeatability of these test results will only be achieved with identical measurement conditions. These conditions include: The same test distance, EUT Height, Measurement Site Characteristics, and the same EUT System Components. The system must have the same Interconnecting Cables arranged in identical placement to that in the test set-up, with the system and/or EUT functioning in the identical mode of operation (i.e. software and so on) as on the date of the test. Any deviation from the test conditions and the environment on the date of the test may result in measurement repeatability difficulties.
All changes made to the EUT during the course of testing as identified in this test report must be incorporated into the EUT or identical models to ensure compliance with the FCC regulations.

Bryan Broaddus (Para. 1.1)
Manager, Test Dept.
DNB Engineering, Inc.
Tel. (714) 870-7781 FAX (714) 870-5081

2.1033 (C) (1) Application for Certification

Name of Applicant:		Paradigm Wireless Systems Inc. 1672 McGaw Ave. Irvine, CA 92614
Applicant is:	X	Manufacturer Vendor Licensee Prospective Licensee Other
Name of Manufacturer		Paradigm Wireless Technology
Description:		RF Power Amplifier
Part Number:		MAF900-60S
Anticipated Production Quantity:		Multiple Units

2.1033 (C) (2) FCC Identifier

FCC ID: OQ3MAF900-60S

2.1033 (C) (3) Installation and Operating Instructions

Please refer to Appendix A

2.1033 (C) (4) Type of Emission

GXW. The device used to modulate this amplifier utilized GMSK modulation. The actual transmitter that will be used in the field was type accepted with an emission designator of 13KOF1D

2.1033 (C) (5) Frequency Range

935 - 940 MHz

2.1033 (C) (6) Operating Power

80 Watts

2.1033 (C) (7) Maximum Power Allowed in Applicable Part(s) of the Rules

RULES PART	MAXIMUM POWER (WATTS)
Part 90.205	80

2.1033 (C) (8) Final RF Amplifier Input Power Characteristics

Please refer to Appendix A

2.1033 (C) (9) Tune Up Procedure

Please refer to Appendix A

2.1033 (C) (10) Schematic Diagram and Circuit Description

Please refer to Appendix B

2.1033 (C) (11) Equipment Identification Plate

RF AMPLIFIER

MODEL NO. MAF900-60S

VOLTAGE: 27 VDC, 27.5A **PWR OUTPUT: 80W**

FCC ID: OQ3MAF900-60S **SERIAL NO._____**

PARADIGM WIRELESS TECHNOLOGY **MADE IN USA**

NOTES:
Label will be constructed of 0.02 inch aluminum as shown on the equipment with permanent adhesive.

All information on the label will be etched or stamped. Both methods will exceed the expected lifetime of the equipment.

The label will be large enough to allow all information to be legible.

2.1033 (C) (12) Equipment Photographs

See Photos in Appendix C

2.1033 (C) (13) Digital Modulation Techniques

Not Applicable

2.1033 (C) (14) Test Data

See Data Plots in Appendix D

2.1046 Measurement of RF Power Output

Definition: For RF Amplifiers.

Test Method: See FIGURE 1.

Output Power is measured across a precision 50 ohm load with a Spectrum Analyzer. For the power measurement, CW (no modulation) is used.

Test Results:

POWER OUTPUT MEASURED AT NOMINAL VOLTAGE WAS:

Frequency (MHz)	Power (dBm)	Power (W)
935	49	80

2.1049 Measurement of Occupied Bandwidth

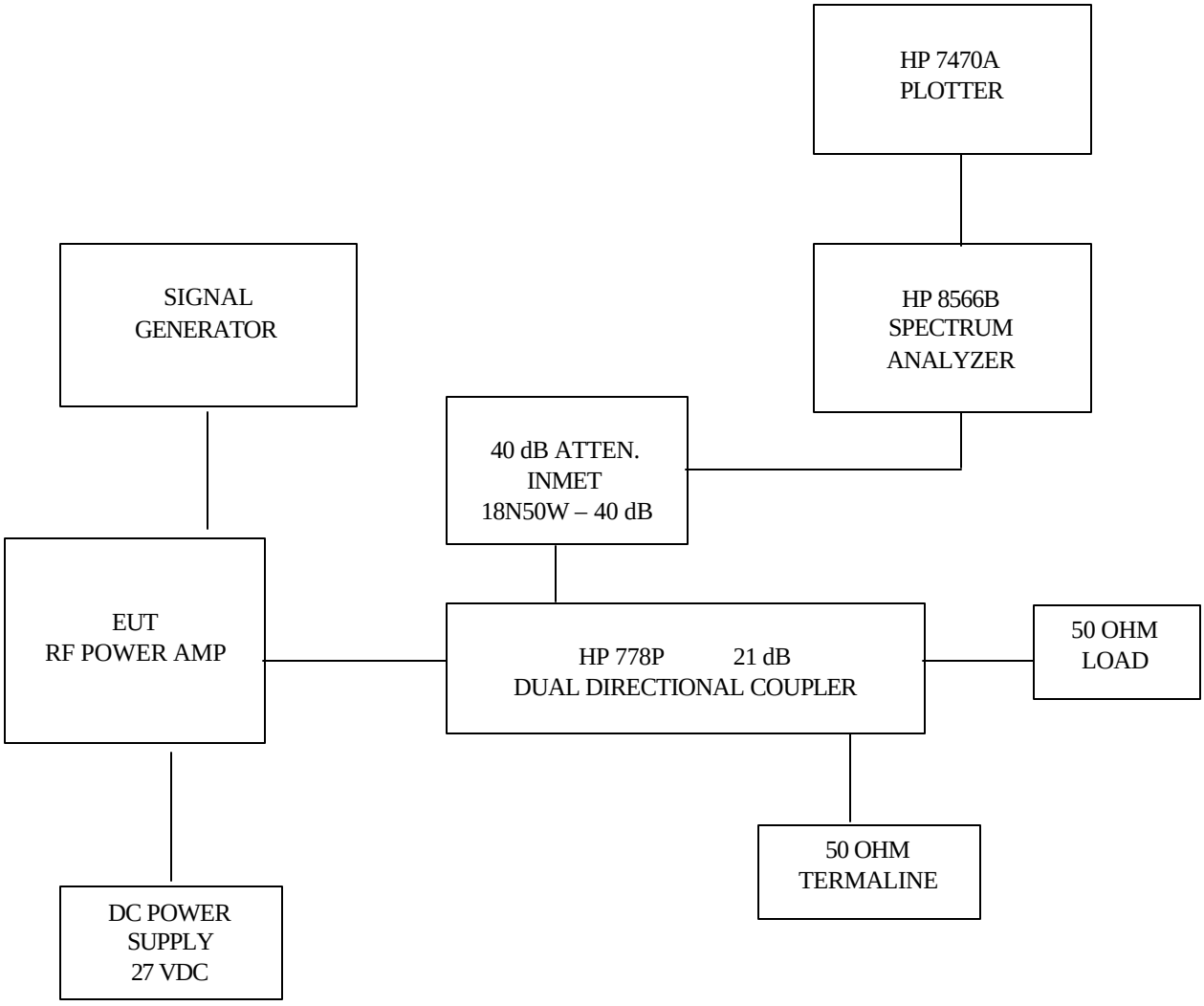
Definition:
Occupied Bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are equal to 0.5 percent of the total mean power radiated by a given emission.

Test Method: Connect the Equipment per FIGURE 1.
Measurements were made while modulation the driving source with a CDMA signal.

Test Results: See Data Plots in Appendix D.

The center frequency of the signal did not shift with modulation. The Spectrum Bandwidth was well within the limits specified in the FCC Regulations.

FIGURE 1: Block Diagram
(Occupied Bandwidth tests)



2.1051 Spurious Emissions at Antenna Terminals

Definition:
Conducted Spurious Emissions are emissions at the antenna terminals on a frequency or frequencies which are outside an occupied band sufficient to ensure transmission of information of required quality for the class of communication desired. The reduction in the level of these spurious emissions will not affect the quality of the information being transmitted.

Conducted Spurious Emissions shall be attenuated below the maximum level of the carrier frequency in accordance with the following formula:

Spurious attenuation in dB = $50 + 10 \log_{10}$ Po

Where Po = Output in Watts (CW)

= $50 + 10 \log_{10}$ (80)

= 69 dB

Test Method: Per EIA RS 152-B, Paragraph 4 as modified below.

Connect the equipment as shown in FIGURE 2.

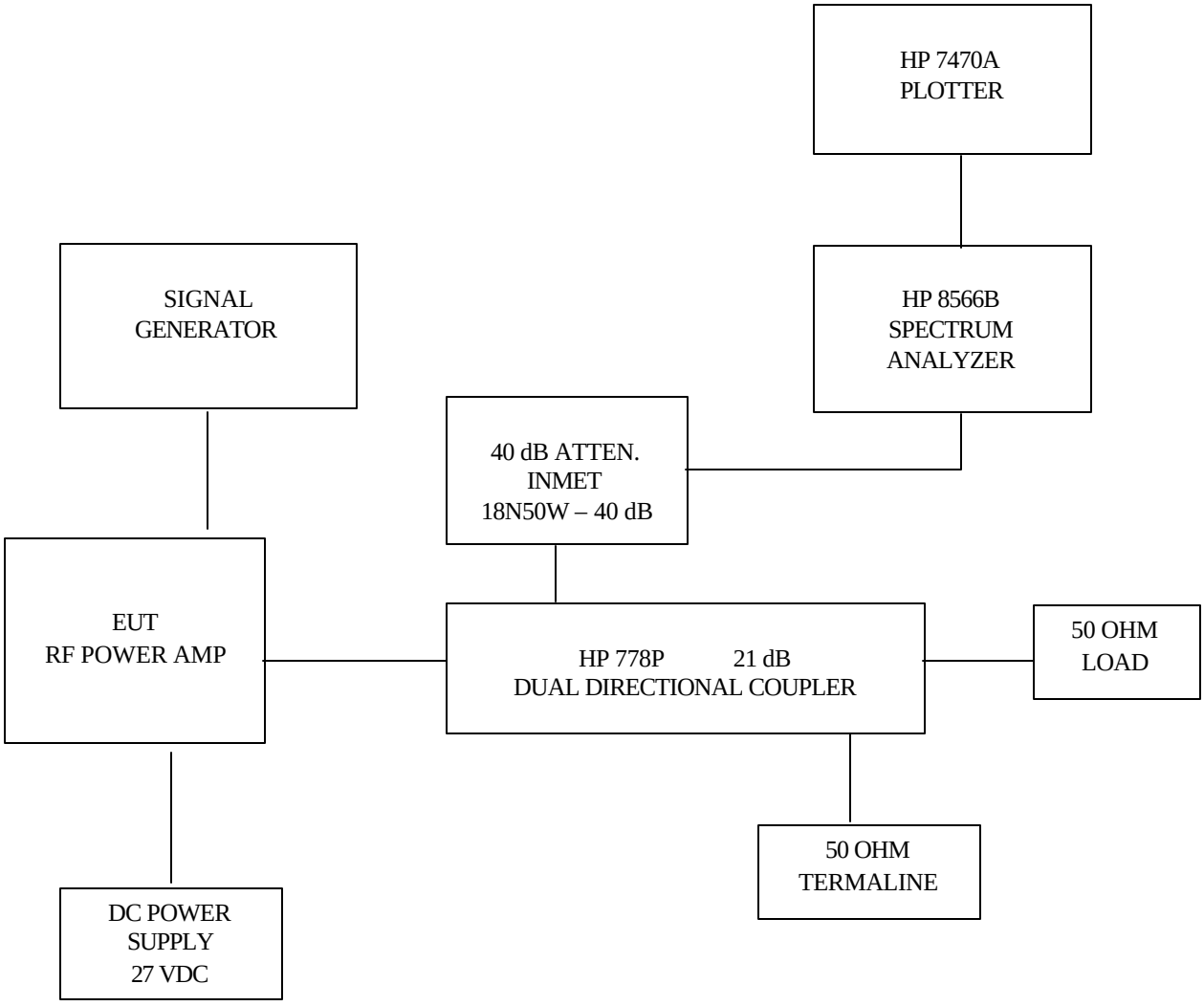
Adjust the drive source to produce the three carrier signals. Adjust the Spectrum Analyzer to display the Modulated Carrier.

Scan the frequency spectrum from the lowest radio frequency generated in the equipment through the 10^{th} harmonic of the carrier frequency.

Test Results: See data plots in Appendix D

All spurious emissions at the antenna terminals are below the FCC specifications

FIGURE 2: Block Diagram
(Spurious Emissions tests)



2.1053 Field Strength of Spurious Radiation

Definition:
Emissions from the equipment when connected into a non-radiating load on a frequency or frequencies which are outside an occupied band sufficient to ensure transmission of information of required quality for the class of communication desired. The reduction in the level of these spurious emissions will not affect the quality of the information being transmitted.

Test Method: Per EIA RS 152-B.

The Spurious signals were measured on a three meter OATS (Open Area Test Site). The equipment used for this measurement was a HP Spectrum Analyzer in peak detection mode. An antenna substitution method was used to determine the radiated spurious levels that were attenuated to 69 dBc or more.

Test Results: See data plots in Appendix D.

All radiated spurious emissions are below the FCC Specifications.

RF Exposure

The information contained in "Evaluating Compliance with FCC Guidelines for Human Exposure to Radio frequency Electromagnetic Fields", OET Bulletin 65; August 1997 is applicable when a radiating antenna is connected to this amplifier. Paging stations that utilize this amplifier authorized under Part 22 (Subpart E) and Part 90 are subject to routine environmental evaluation for RF exposure if an antenna is located on a rooftop and if its ERP exceeds 1000 watts.

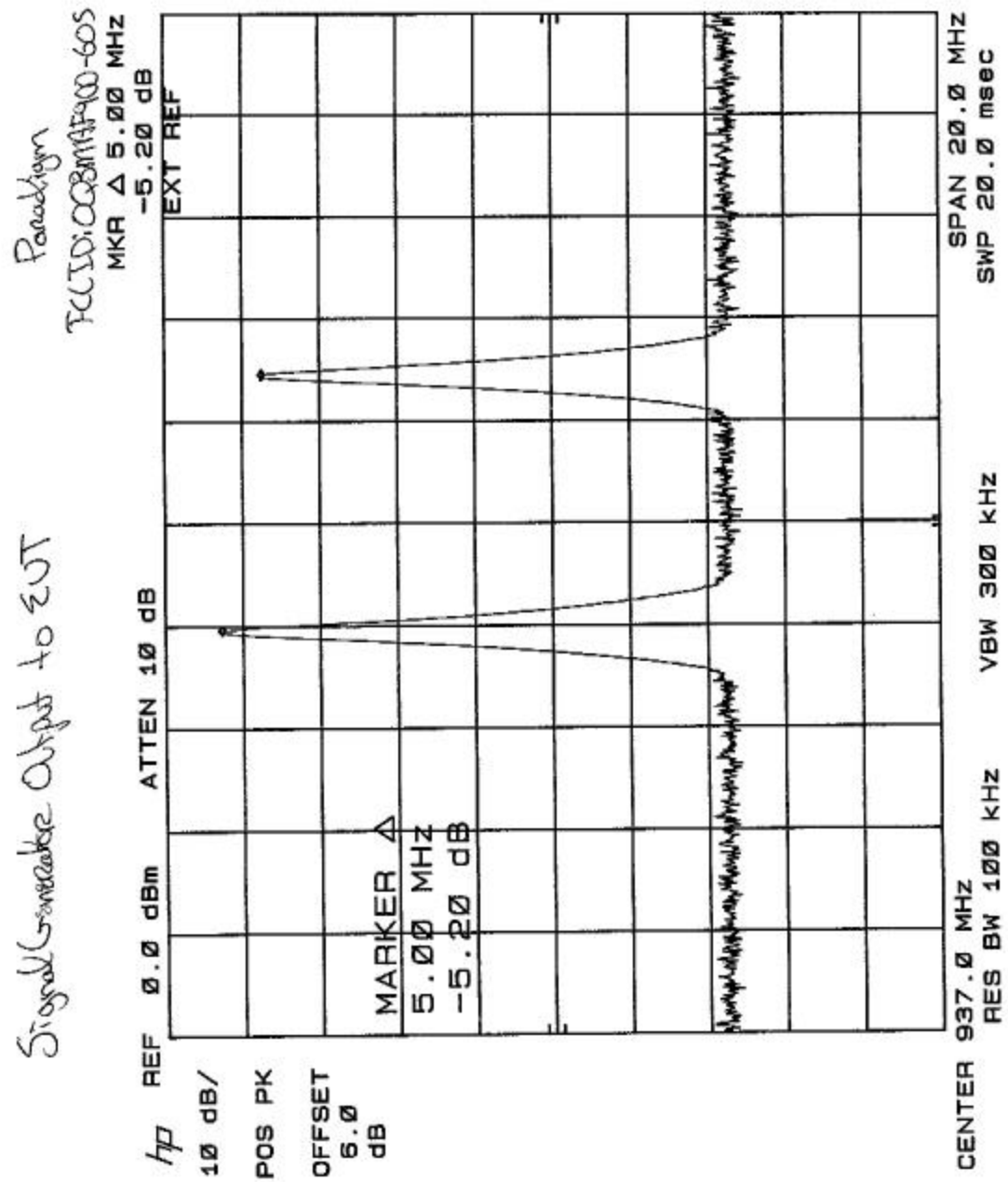
This product is certified to meet the RF exposure guidelines of OET-65 as a stand-alone RF power amplifier. The RF spurious emissions recorded when the antenna output connector is terminated into a non-radiating 50 ohm load do not exceed the 27.5 V/m limit specified for General Population/Uncontrolled Exposure in OET Bulletin 65.

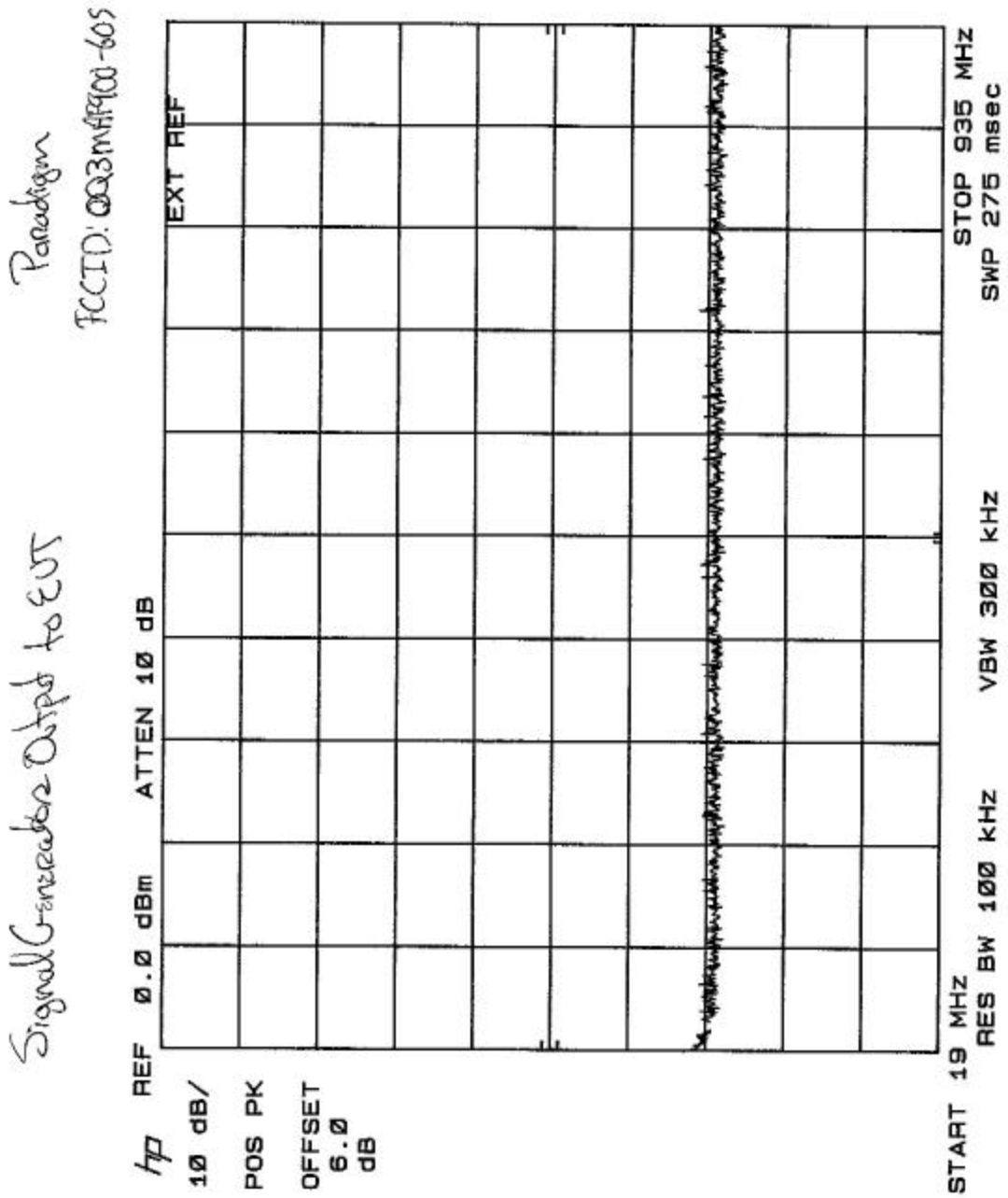
2.1055 Measurement of Frequency Stability

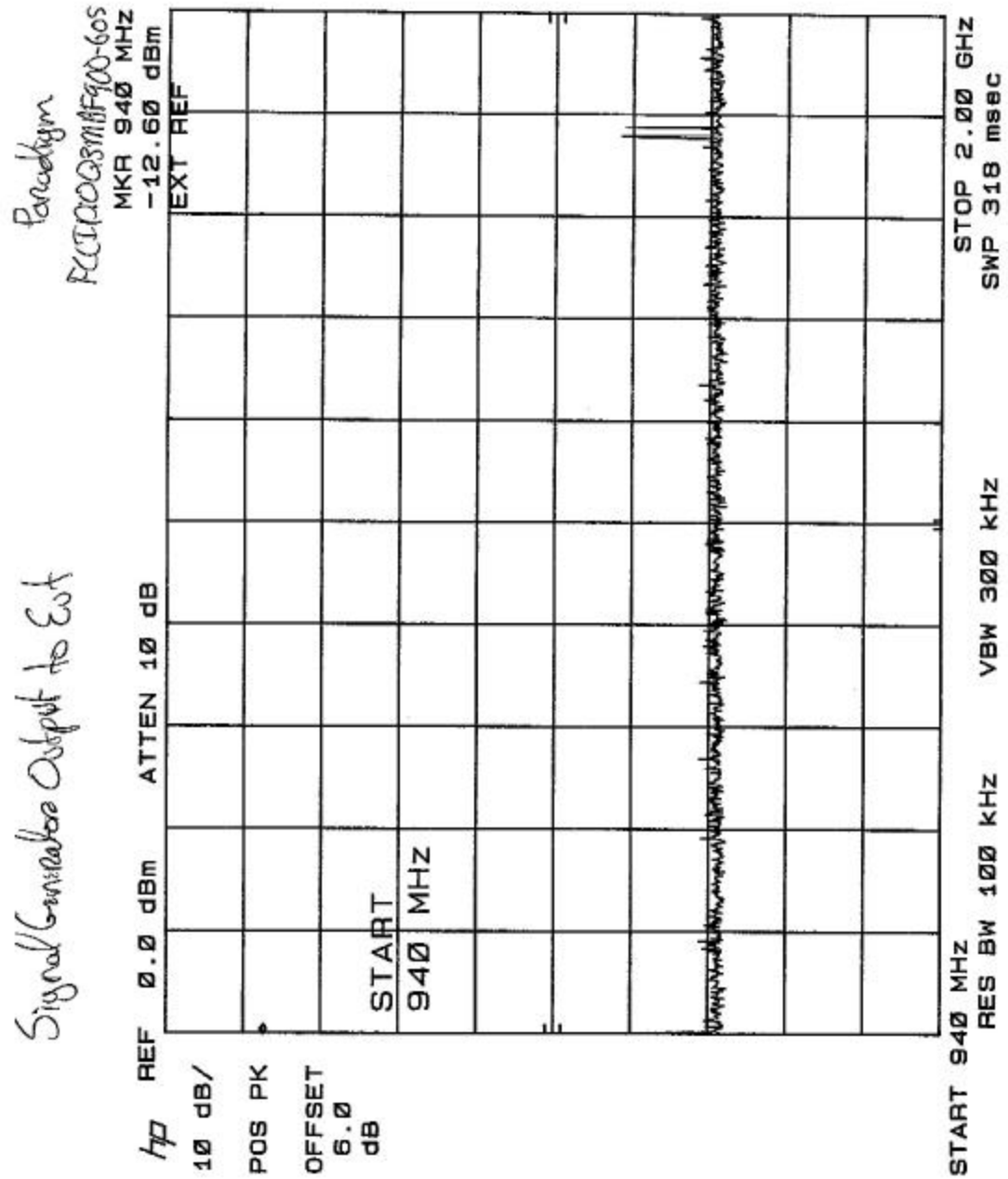
The EUT is a power amplifier and contains no circuitry for generating or stabilizing the RF signal. The driver will be responsible for this task.

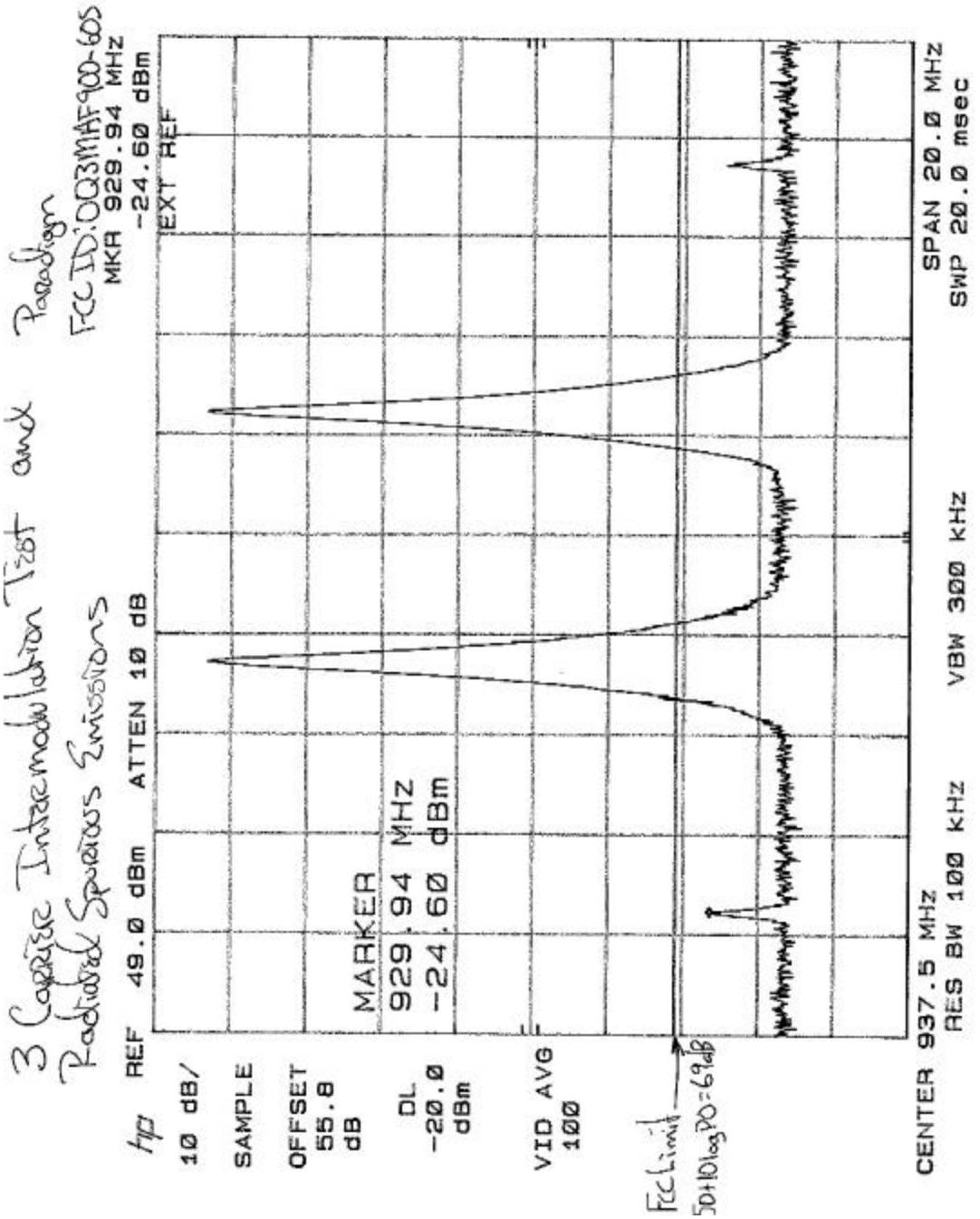
2.1057 Frequency Spectrum to be Investigated

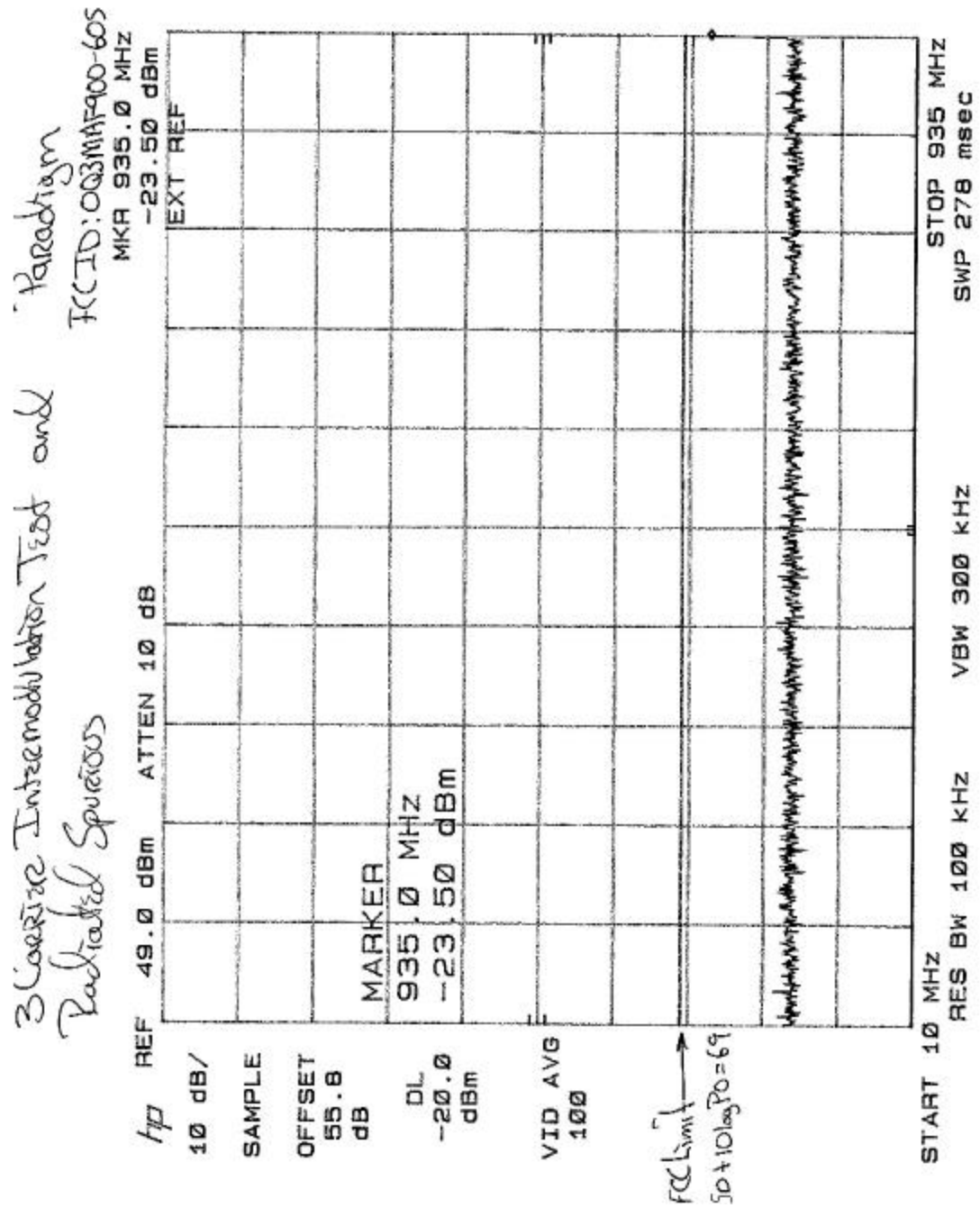
The Frequency was searched from the lowest radio frequency generated in the equipment through the 10^{th} harmonic of the carrier frequency.

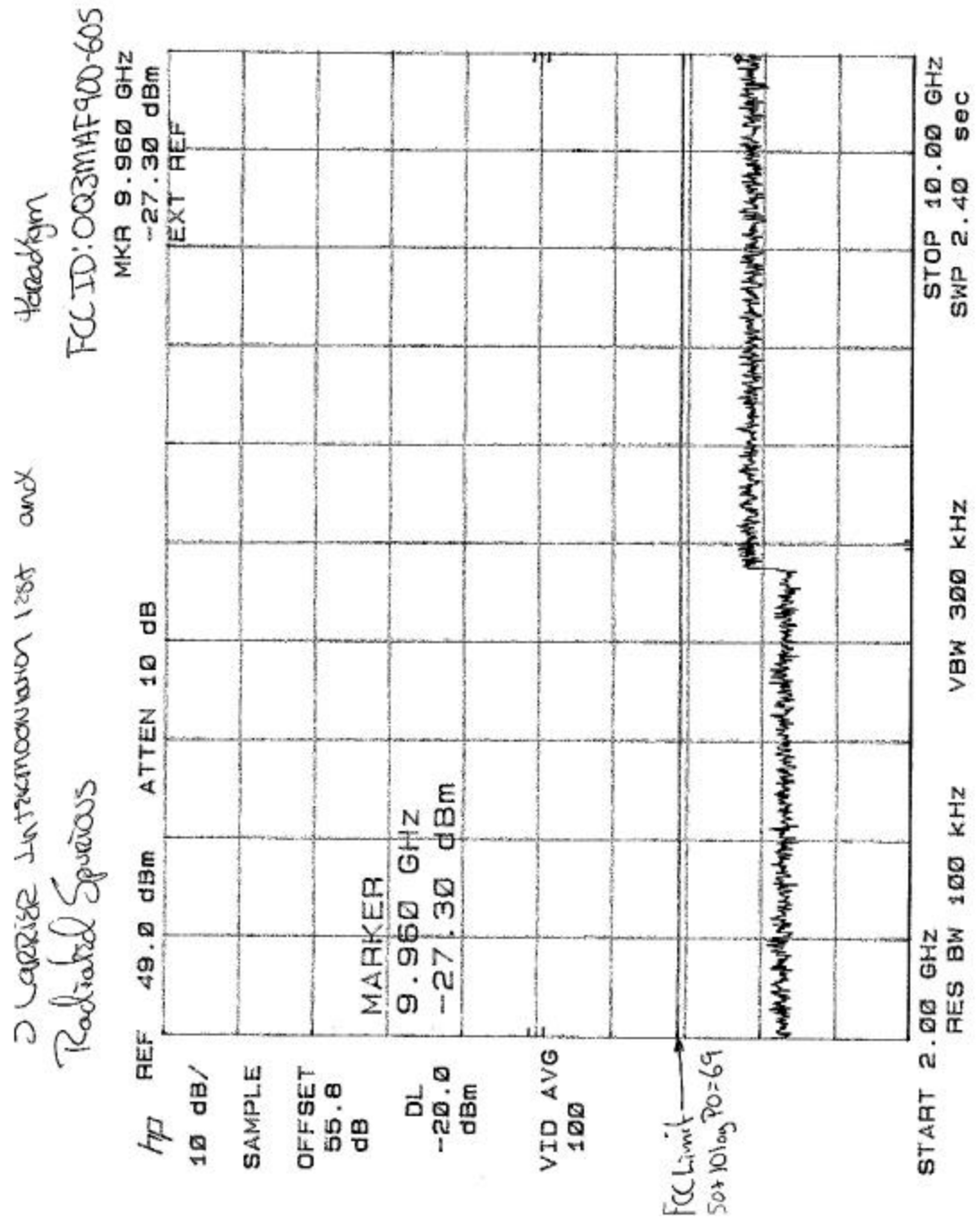

Signal Generator Output to EUT
Paradigm
FCC ID: OQ3MAF900-60S
MKR Δ 5.00 MHz
-5.20 dB
EXT REF
hp
REF 0.0 dBm
ATTEN 10 dB
10 dB/
POS PK
OFFSET
5.0
dB
MARKER Δ
5.00 MHz
-5.20 dB
CENTER 937.0 MHz
RES BW 100 kHz
VBW 300 kHz
SPAN 20.0 MHz
SWP 20.0 msec

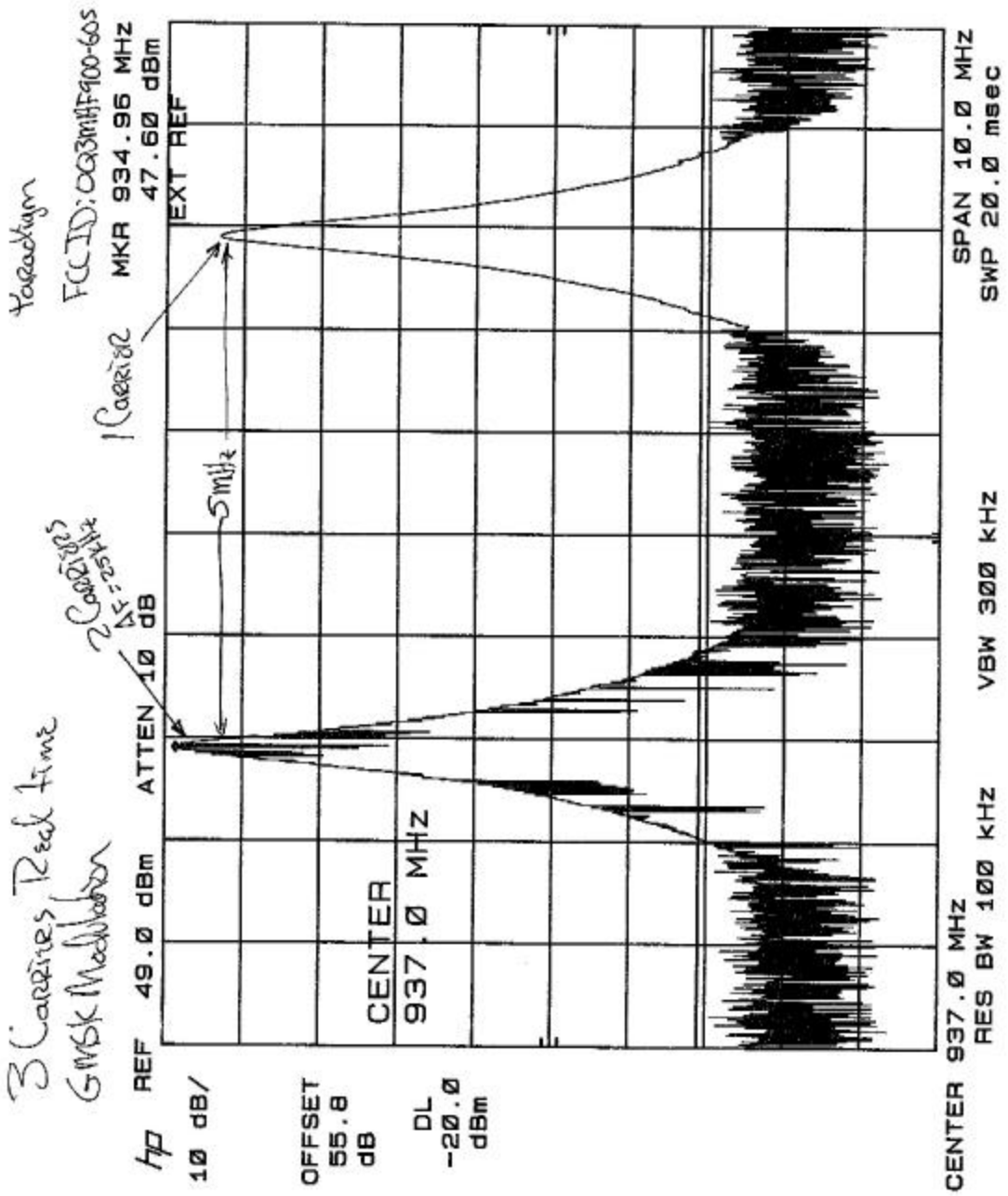

Signal Generator Output to EUT
Paradigm
FCCID: OQ3MAF900-60S
REF 0.0 dBm
ATTEN 10 dB
EXT REF
10 dB/
POS PK
OFFSET
6.0
dB
START 19 MHz
RES BW 100 kHz
VBW 300 kHz
STOP 935 MHz
SWP 275 msec

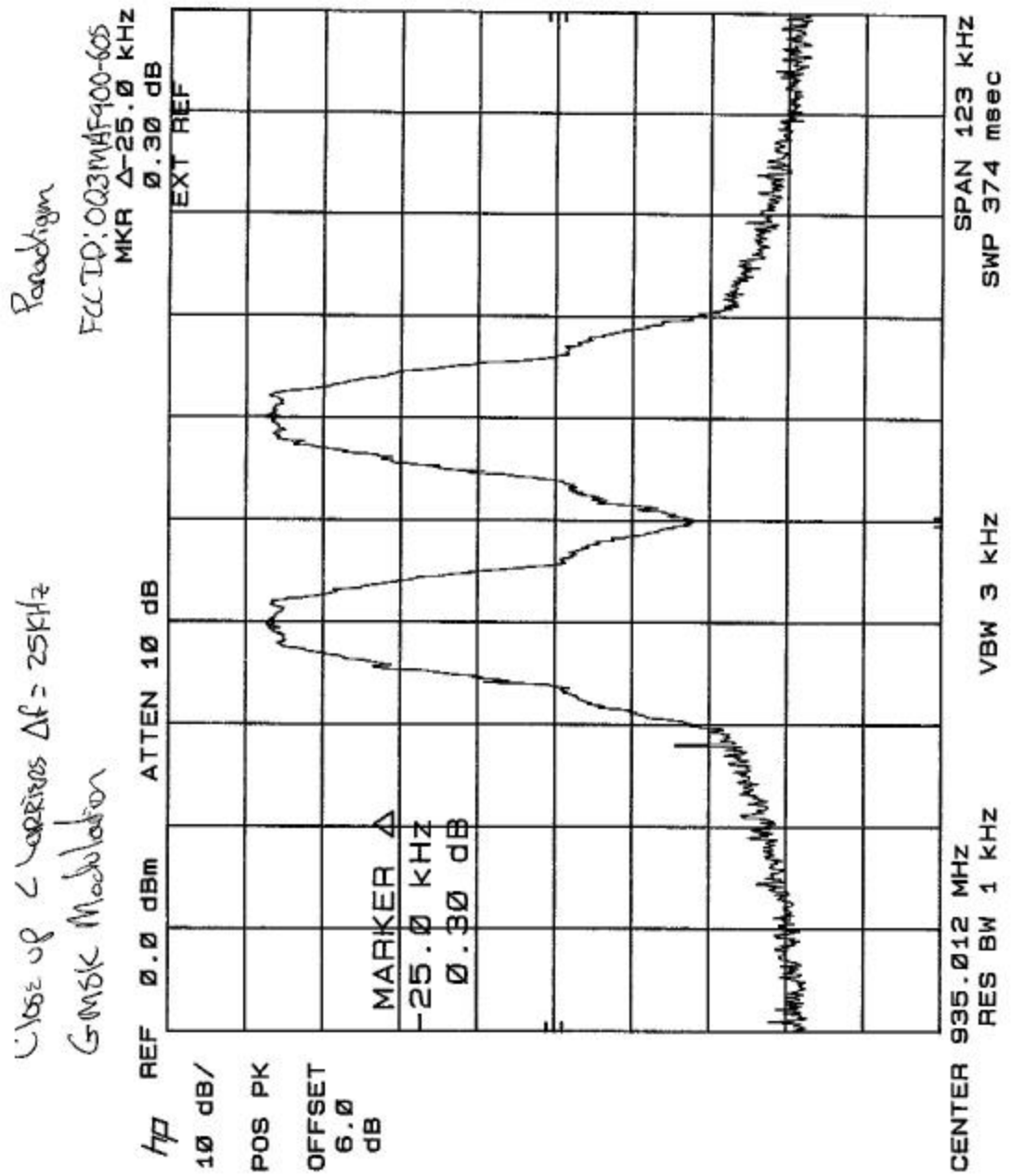

Signal Generator Output to Ext
Paradigm
FCC ID OQ3MAF900-60S
MKR 940 MHz
-12.60 dBm
EXT REF
hp
REF 0.0 dBm
ATTEN 10 dB
10 dB/
POS PK
OFFSET
6.0
dB
START
940 MHz
START 940 MHz
RES BW 100 kHz
VBW 300 kHz
STOP 2.00 GHz
SWP 318 msec

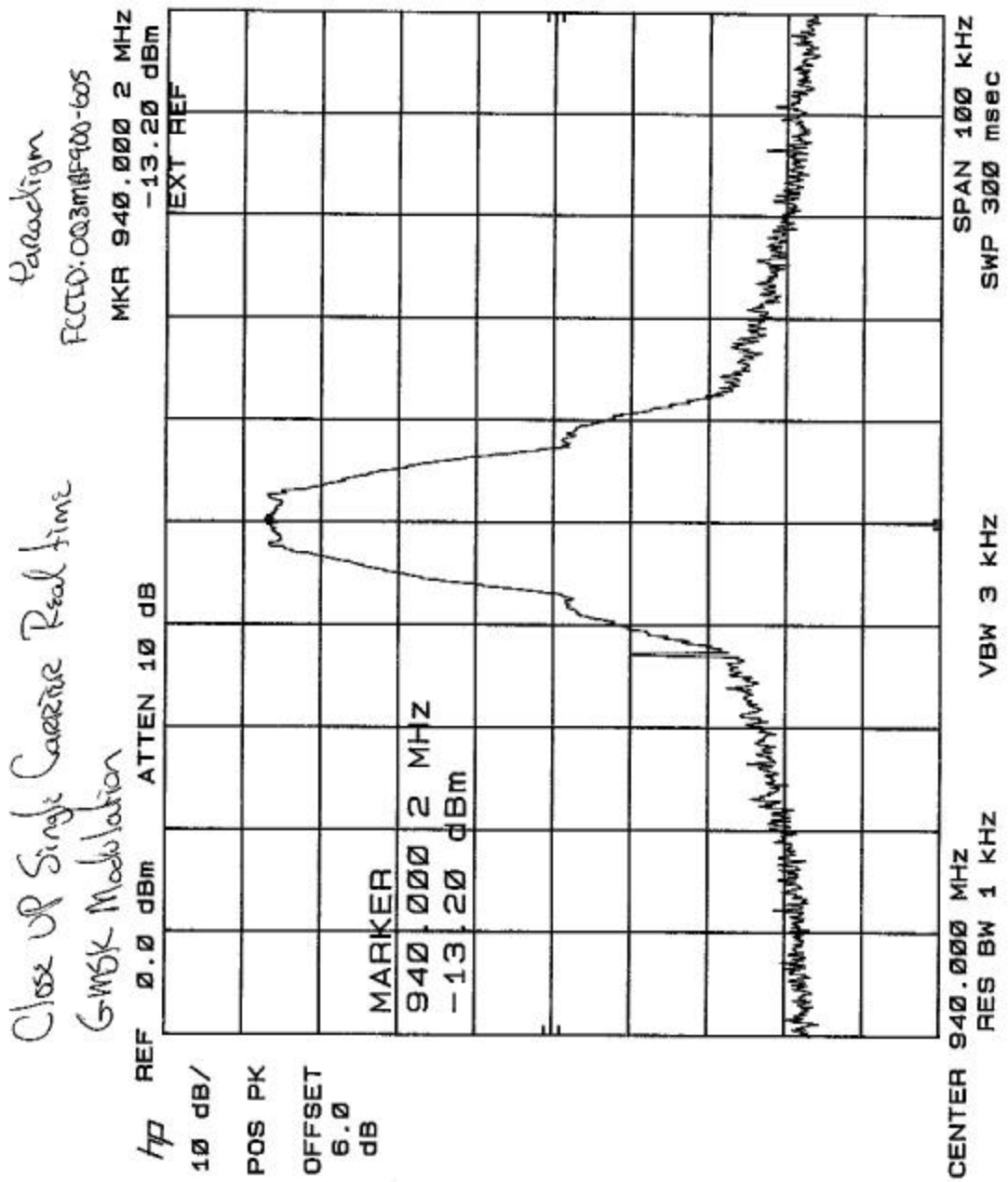

3 Carrier Intermodulation Test and Radiated Spurious Emissions
FCC ID:OQ3MAF900-60S
Paradigm
MKR 929.94 MHz
-24.60 dBm
EXT REF
hp
REF 49.0 dBm
ATTEN 10 dB
10 dB/
SAMPLE
OFFSET
55.8
dB
DL
-20.0
dBm
VID AVG
100
MARKER
929.94 MHz
-24.60 dBm
FCC Limit
50+10log PO=69dB
CENTER 937.5 MHz
RES BW 100 kHz
VBW 300 kHz
SPAN 20.0 MHz
SWP 20.0 msec

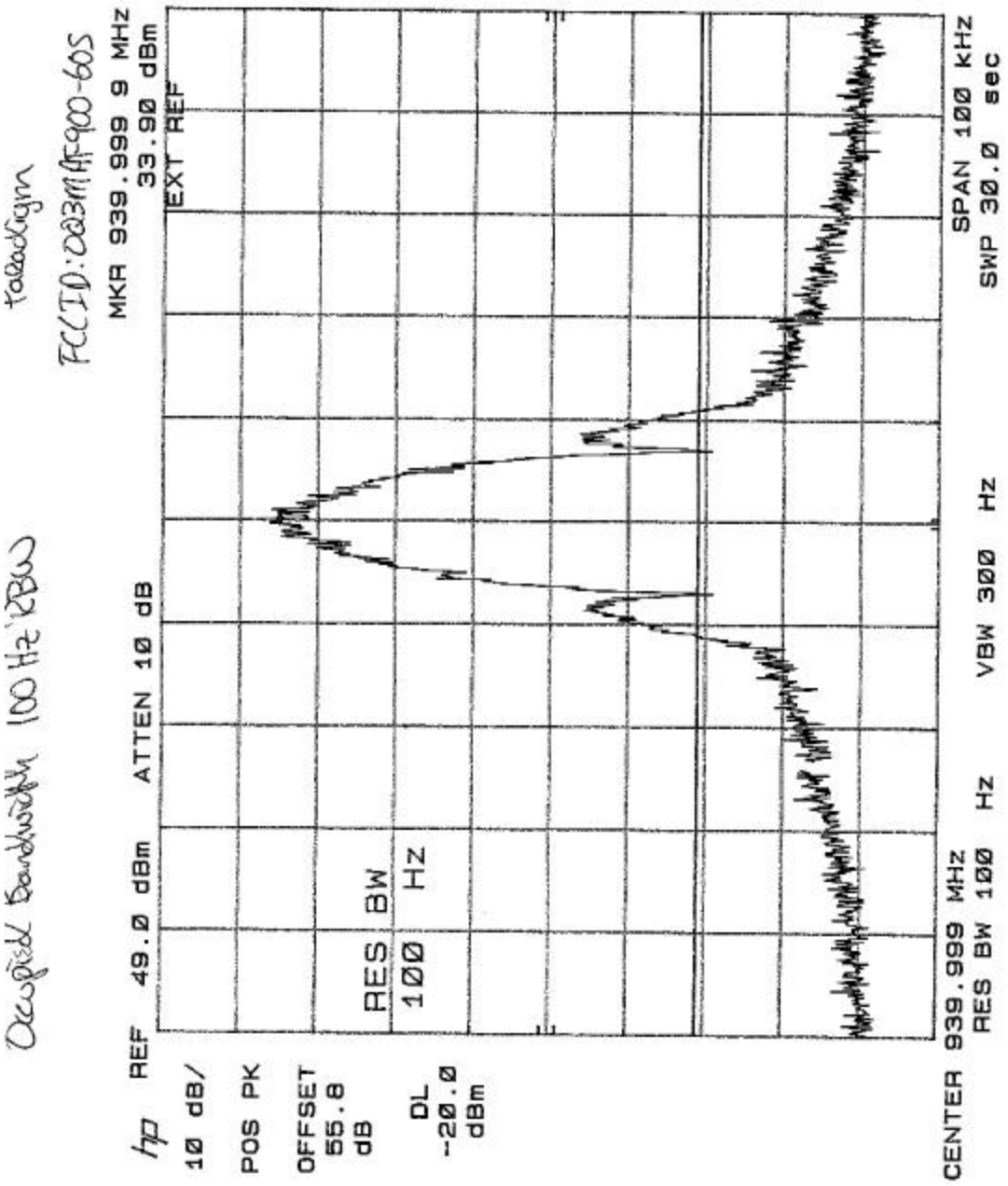

3 Carrier Intermodulation Test and Radiated Spurious
Paradigm
FCC ID: OQ3MAF900-60S
MKR 935.0 MHz
-23.50 dBm
EXT REF
REF 49.0 dBm
ATTEN 10 dB
10 dB/
SAMPLE
OFFSET
55.8
dB
DL
-20.0
dBm
VID AVG
100
MARKER
935.0 MHz
-23.50 dBm
FCC Limit
50 + 10log Po = 69
START 10 MHz
RES BW 100 kHz
VBW 300 kHz
STOP 935 MHz
SWP 278 msec

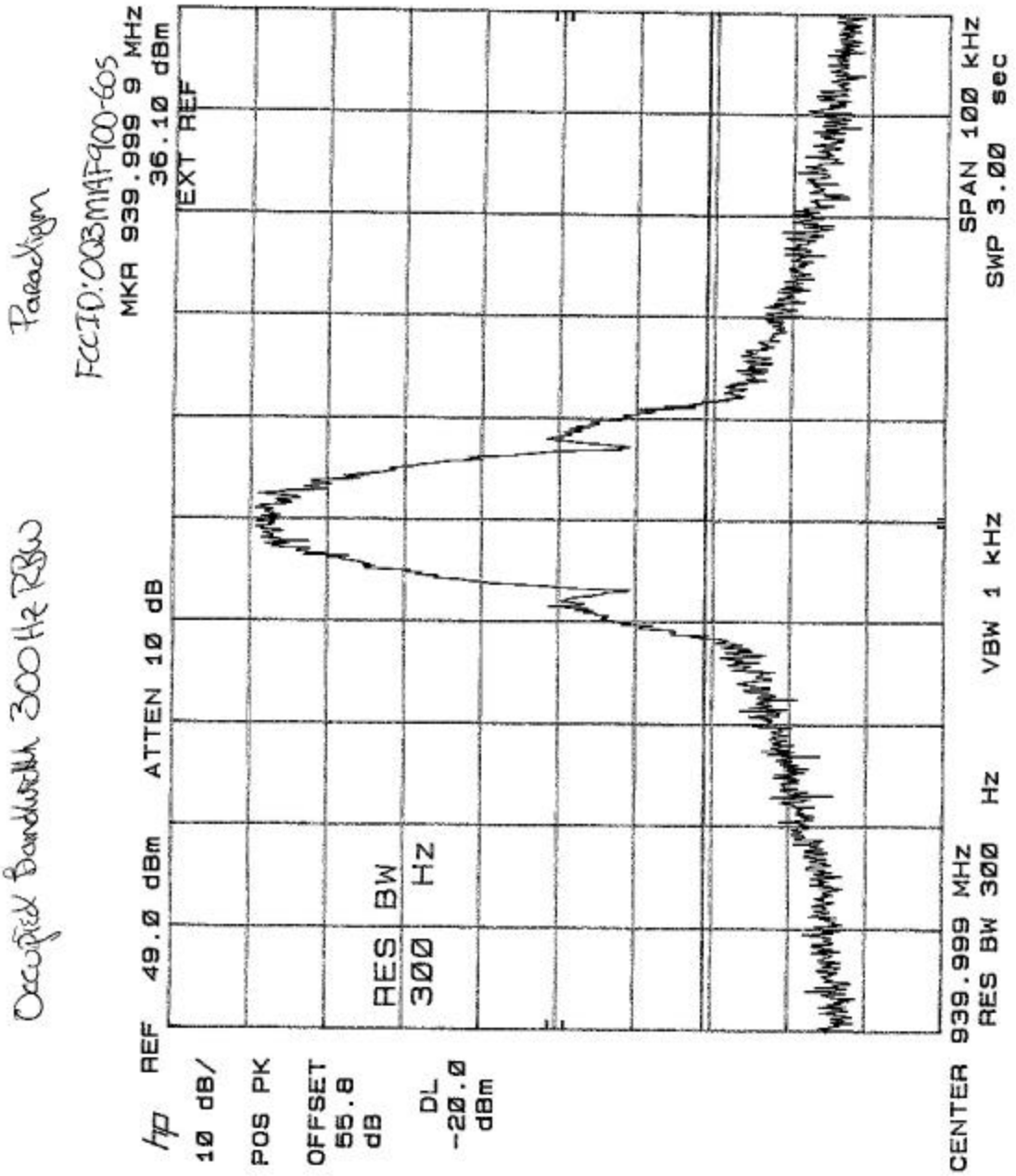

3 carrier intermodulation test and
Radiated Spurious
FCC ID: OQ3MAF900-60S
Headgym
MKR 9.960 GHz
-27.30 dBm
EXT REF
REF 49.0 dBm
ATTEN 10 dB
10 dB/
SAMPLE
OFFSET
55.8
dB
DL
-20.0
dBm
VID AVG
100
MARKER
9.960 GHz
-27.30 dBm
FCC Limit
50+10log PO=69
START 2.00 GHz
RES BW 100 kHz
VBW 300 kHz
STOP 10.00 GHz
SWP 2.40 sec

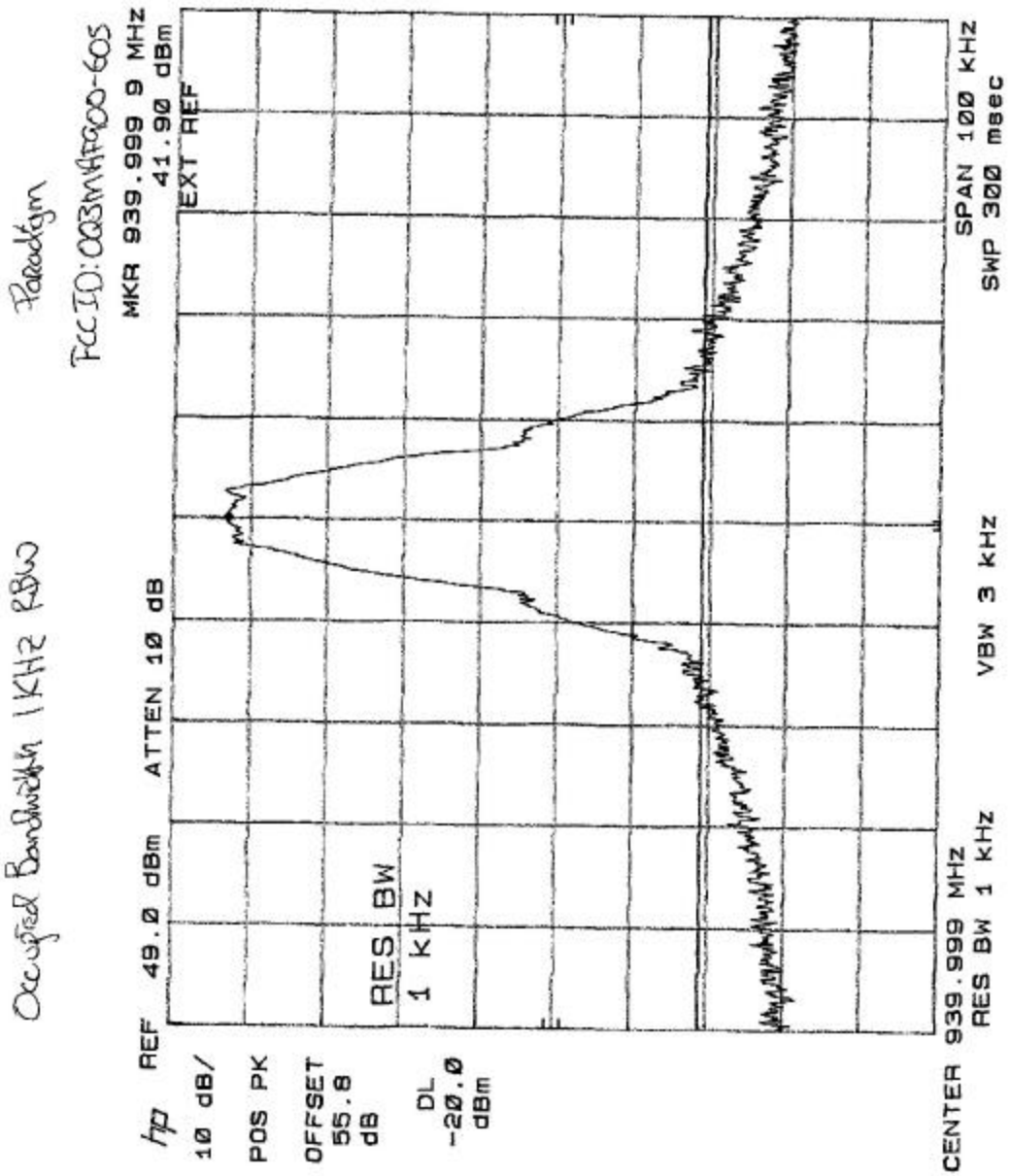

3 Carriers Peak Time
GMSK Modulation
2 Carriers Δf = 250kHz
5MHz
1 Carrier
Yaesu
FCC ID: OQ3MAF900-60S
MKR 934.96 MHz
47.60 dBm
EXT REF
REF 49.0 dBm
ATTEN 10 dB
10 dB/
OFFSET 55.8 dB
DL -20.0 dBm
CENTER 937.0 MHz
CENTER 937.0 MHz
RES BW 100 kHz
VBW 300 kHz
SPAN 10.0 MHz
SWP 20.0 msec

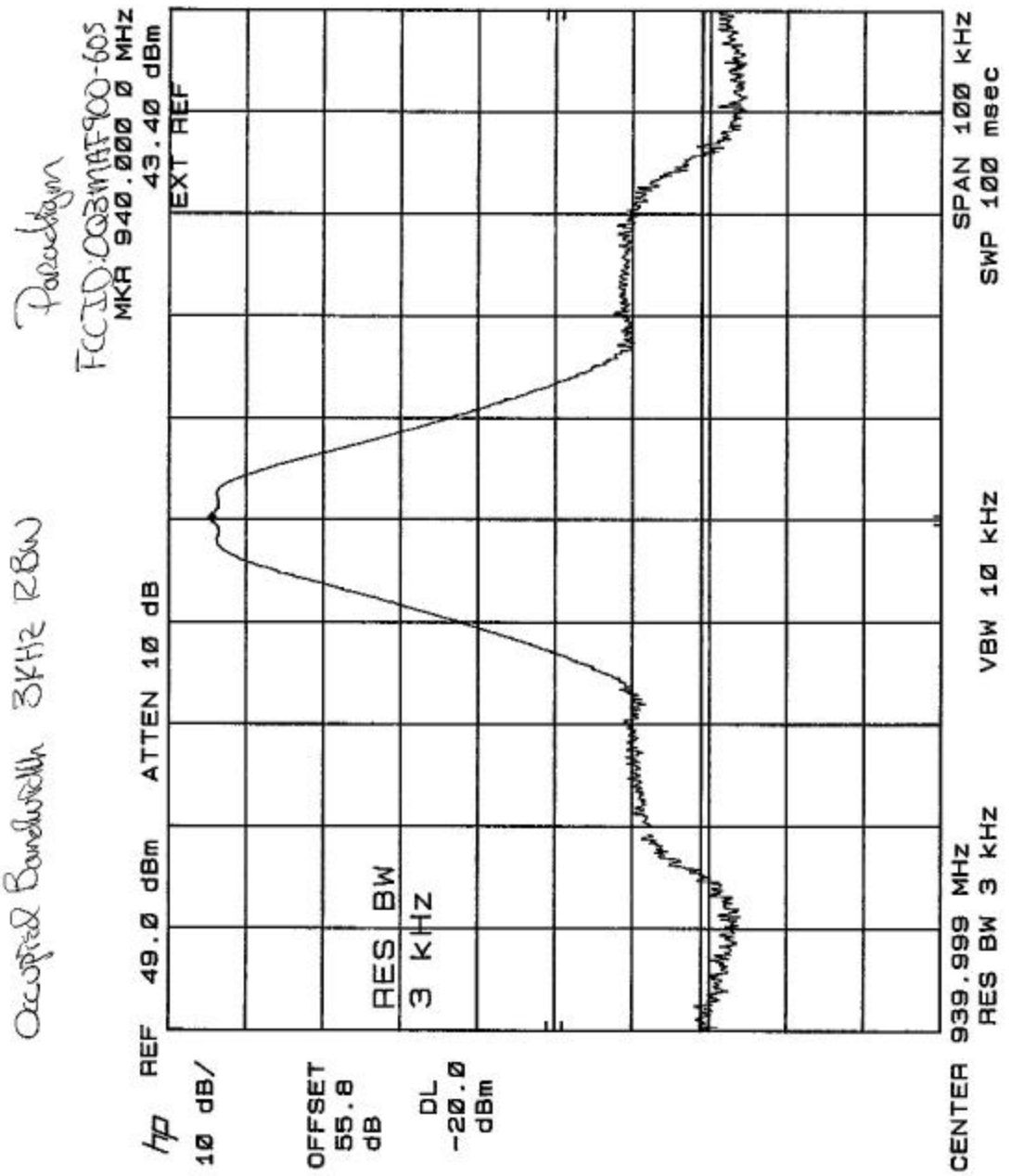

Close up 2 carriers Δf = 25KHz
GMSK Modulation
Paradigm
FCC ID: OQ3MAF900-60S
MKR Δ-25.0 kHz
0.30 dB
EXT REF
hp
REF 0.0 dBm
ATTEN 10 dB
10 dB/
POS PK
OFFSET
6.0
dB
MARKER Δ
-25.0 kHz
0.30 dB
CENTER 935.012 MHz
RES BW 1 kHz
VBW 3 kHz
SPAN 123 kHz
SWP 374 msec


Close Up Single Carrier Real time
GMSK Modulation
Paradigm
FCCID: OQ3MAF900-60S
MKR 940.000 2 MHz
-13.20 dBm
EXT REF
REF 0.0 dBm
ATTEN 10 dB
10 dB/
POS PK
OFFSET
6.0
dB
MARKER
940.000 2 MHz
-13.20 dBm
CENTER 940.000 MHz
RES BW 1 kHz
VBW 3 kHz
SPAN 100 kHz
SWP 300 msec


Occupied Bandwidth 100 Hz RBW
FCC ID: OQ3MAF900-60S
hp REF 49.0 dBm ATTEN 10 dB
MKR 939.999 9 MHz
33.90 dBm
EXT REF
10 dB/
POS PK
OFFSET
55.8
dB
DL
-20.0
dBm
RES BW
100 Hz
CENTER 939.999 MHz
RES BW 100 Hz
VBW 300 Hz
SPAN 100 kHz
SWP 30.0 sec


Occupied Bandwidth 300 Hz RBW
FCC ID: OQ3MAF900-60S
Parachute
MKR 939.999 9 MHz
36.10 dBm
EXT REF
REF 49.0 dBm
ATTEN 10 dB
10 dB/
POS PK
OFFSET
55.8
dB
RES BW
300 Hz
DL
-20.0
dBm
CENTER 939.999 MHz
RES BW 300 Hz
VBW 1 kHz
SPAN 100 kHz
SWP 3.00 sec


Occupied Bandwidth 1KHz RBW
Paradigm
FCC ID: OQ3MAF900-60S
MKR 939.999 9 MHz
41.90 dBm
EXT REF
REF 49.0 dBm
ATTEN 10 dB
10 dB/
POS PK
OFFSET
55.8
dB
RES BW
1 kHz
DL
-20.0
dBm
CENTER 939.999 MHz
RES BW 1 kHz
VBW 3 kHz
SPAN 100 kHz
SWP 300 msec


Occupied Bandwidth 3KHz RBW
Peak Hold
FCC ID:OQ3MAF900-60S
MKR 940.000 0 MHz
43.40 dBm
EXT REF
hp REF 49.0 dBm ATTEN 10 dB
10 dB/
OFFSET
55.8
dB
RES BW
3 kHz
DL
-20.0
dBm
CENTER 939.999 MHz
RES BW 3 kHz
VBW 10 kHz
SPAN 100 kHz
SWP 100 msec