Nemko Test Report No.:	4L0134RUS1
Applicant:	Communication Components, Inc. 89 Leuning Street Second Floor Hackensack, NJ 07606
Equipment Under Test:	DAB-1819-125
In Accordance With:	**FCC Part 24, Subpart E** Broadband PCS Amplifiers
Tested By:	Nemko Dallas Inc. 802 N. Kealy Lewisville, Texas 75057-3136
Authorized By:	Tom Tidwell, Frontline Group Manager
Date:	3/22/04
Total Number of Pages:	37

Table of Contents

Section 1. Summary of Test Results

Manufacturer: Communication Components

Model No.: DAB-1819-125

Serial No.: E005730

General: **All measurements are traceable to national standards.**

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC Part 24, Subpart E.

☒	New Submission	☒	Production Unit
☐	Class II Permissive Change	☐	Pre-Production Unit

THIS TEST REPORT RELATES ONLY TO THE ITEM(S) TESTED.

THE FOLLOWING DEVIATIONS FROM, ADDITIONS TO, OR EXCLUSIONS FROM THE TEST SPECIFICATIONS HAVE BEEN MADE. NONE

Summary Of Test Data

NAME OF TEST	PARA. NO.	SPEC.	RESULT
RF Power Output	24.232	100W	Complies
Occupied Bandwidth	24.238	Input/Output	Complies
Spurious Emissions at Antenna Terminals	24.238(a)	-13 dBm	Complies
Field Strength of Spurious Emissions	24.238(a)	-13 dBm E.I.R.P.	Complies
Frequency Stability	24.235		NA

Measurement uncertainty for each test configuration is expressed to 95% probability.

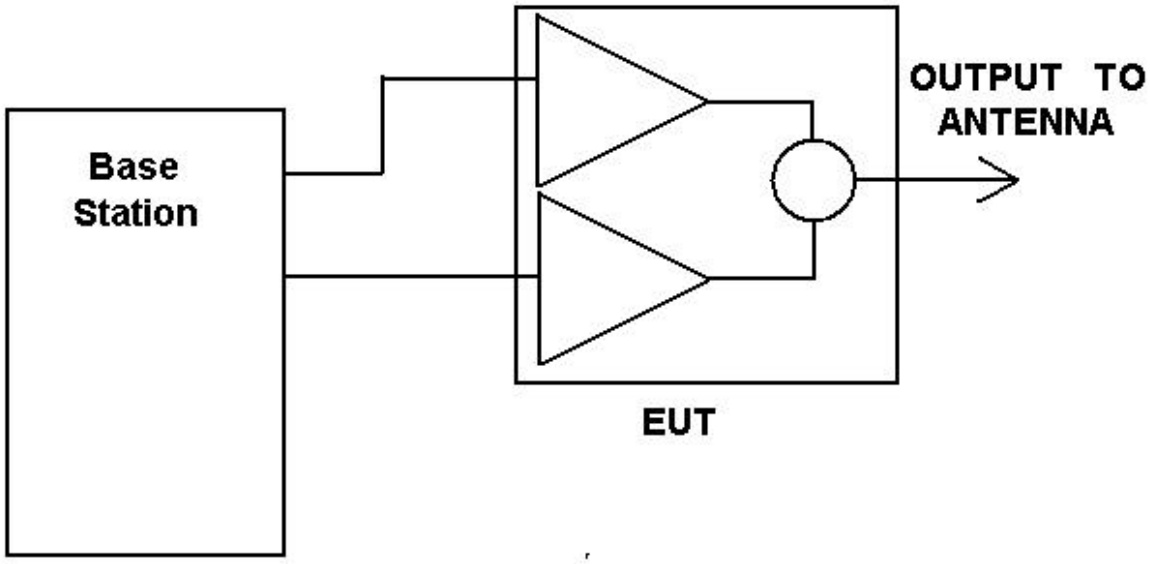
Section 2. General Equipment Specification

Supply Voltage Input:		120 VAC
Frequency Bands:	**Downlink:**	☒ Block A: 1930 – 1945 MHz ☒ Block D 1945 – 1950 MHz ☒ Block B: 1950 – 1965 MHz ☒ Block E 1965 – 1970 MHz ☒ Block F : 1970 – 1975 MHz ☒ Block C 1975 – 1990 MHz
Frequency Bands:	**Uplink:**	☐ Block A 1850 – 1865 MHz ☐ Block B: 1865 – 1870 MHz ☐ Block C 1870 – 1885 MHz ☐ Block D 1885 – 1890 MHz ☐ Block E: 1890 – 1895 MHz ☐ Block F : 1895 – 1910 MHz
Type of Modulation and Designator:		**CDMA (F9W)** ☐ **GSM (GXW)** ☒ **EDGE (G7W)** ☒
Output Impedance:		50 ohms
RF Output (Rated):	**Uplink**	Per channel: NA W Total: NA W
RF Output (Rated):	**Downlink**	Per channel: 62.5 W Total: 125 W **Power output needs to be lowered to 33.2 dBm at 1930.2 and 1989.8 MHz (Bandedges) to achieve compliance when using GSM or EDGE modulation.**
Frequency Translation:		**F1-F1** ☒ **F1-F2** ☐ **N/A** ☐
Band Selection:		**Software** ☐ **Duplexer** ☐ **Fullband** ☒

Description of EUT

The device is a base station amplifier operating in the PCS band utilizing GSM and GSM EDGE technology. Each input outputs 62.5 Watts single carrier only and input into a combiner prior to output. The device is rated at 125 Watts combined power.

System Diagram



Section 3. RF Power Output

NAME OF TEST: RF Power Output	PARA. NO.: 2.1046
TESTED BY: David Light	DATE: 3/12/04

Test Results: Complies.

Measurement Data:

	Modulation Type	Per Channel Output Power (dBm)	Composite Output Power (dBm)
Uplink	GSM	NA	NA
Downlink	GSM	62.5	125
Uplink	GSM EDGE	NA	NA
Downlink	GSM EDGE	62.5	125

Note – The device was tested at 125 Watts max power to compensate for any insertion loss prior to antenna input.

Reduced Power measurements at Band Edges

	Modulation Type	Single Channel Output Power (1930.2MHz)	Single Channel Output Power (1989.8MHz)	
Downlink	EDGE	33.2dBm	33.2dBm	
Downlink	GSM	33.2dBm	33.2dBm	

Equipment Used: 1464-1064-1055-1626

Measurement Uncertainty: +/- 1.7 dB

Temperature: 22 ?C

Relative Humidity: 40%

Section 4. Occupied Bandwidth

NAME OF TEST: Occupied Bandwidth	PARA. NO.: 2.1049
TESTED BY: David Light	DATE:3/12/04

Test Results: Complies.

Test Data: See attached plot(s).

Test Data – Occupied Bandwidth

Dallas Headquarters:
802 N. Kealy
Lewisville, TX 75057
Tel: (972) 436-9600
Fax: (972) 436-2667

Nemko Dallas, Inc.

Data Plot **Occupied Bandwidth**

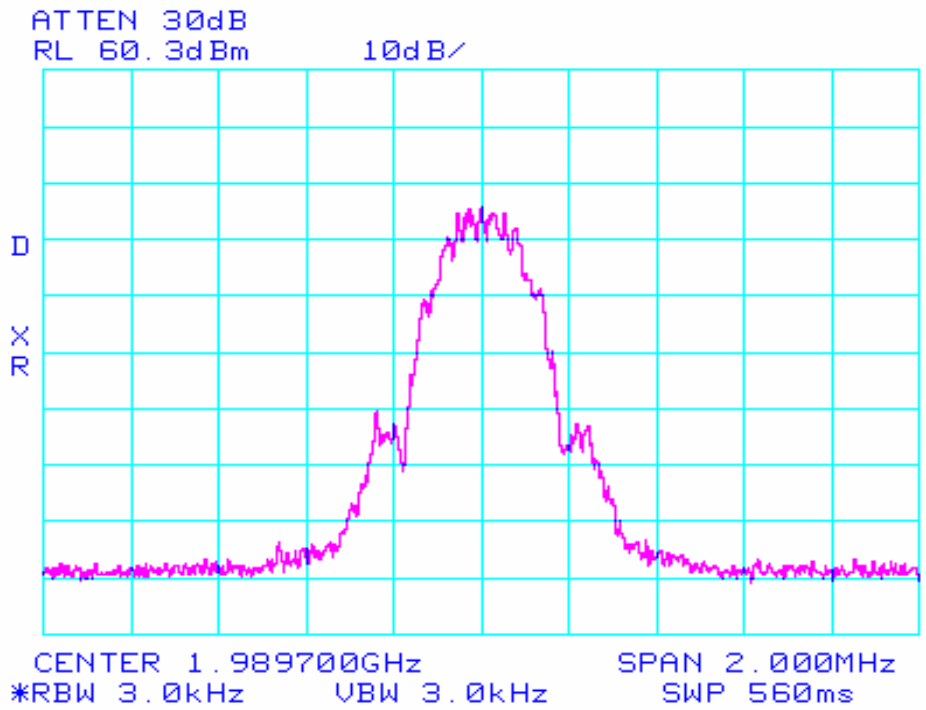
Page 1 of 4

Complete X
Preliminary: ____

Job No.: 3L0075R Date: 3/12/2004
Specification: PT 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 40
E.U.T.: DAC-1819-125
Configuration: TX FULL POWER
Sample Number: 1
Location: Lab 2 RBW: 3 kHz Measurement
Detector Type: Peak VBW: 3 kHz Distance: NA m

Test Equipment Used

Antenna: ____ Directional Coupler: 1055
Pre-Amp: ____ Cable #1: 1626
Filter: ____ Cable #2: ____
Receiver: 1464 Cable #3: ____
Attenuator #1 1064 Cable #4: ____
Attenuator #2: Mixer: ____
Additional equipment used: ____
Measurement Uncertainty: +/-1.7 dB



Notes: **OUTPUT, GSM EDGE, 62.5 watts**

Test Data – Occupied Bandwidth

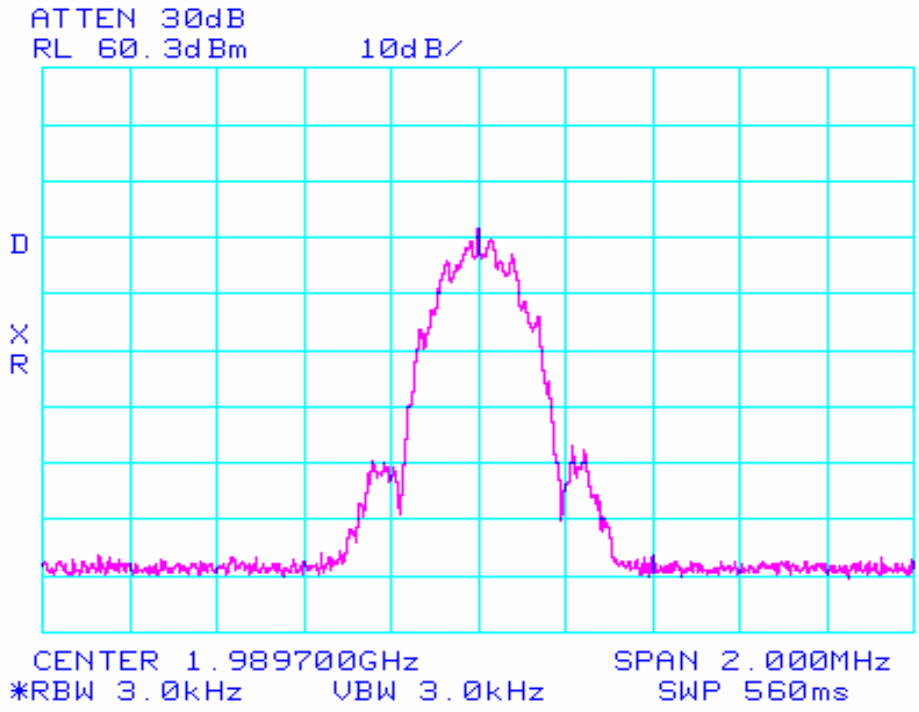
Dallas Headquarters:
802 N. Kealy
Lewisville, TX 75057
Tel: (972) 436-9600
Fax: (972) 436-2667

Nemko Dallas, Inc.

Data Plot **Occupied Bandwidth**

Page ~~2~~ of 4

Job No.: 3L0075R Date: 3/12/2004
Specification: PT 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 40
E.U.T.: DAC-1819-125
Configuration: TX FULL POWER



Notes: **INPUT, GSM EDGE**

Test Data – Occupied Bandwidth

Dallas Headquarters:
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Lewisville, TX 75057
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Fax: (972) 436-2667

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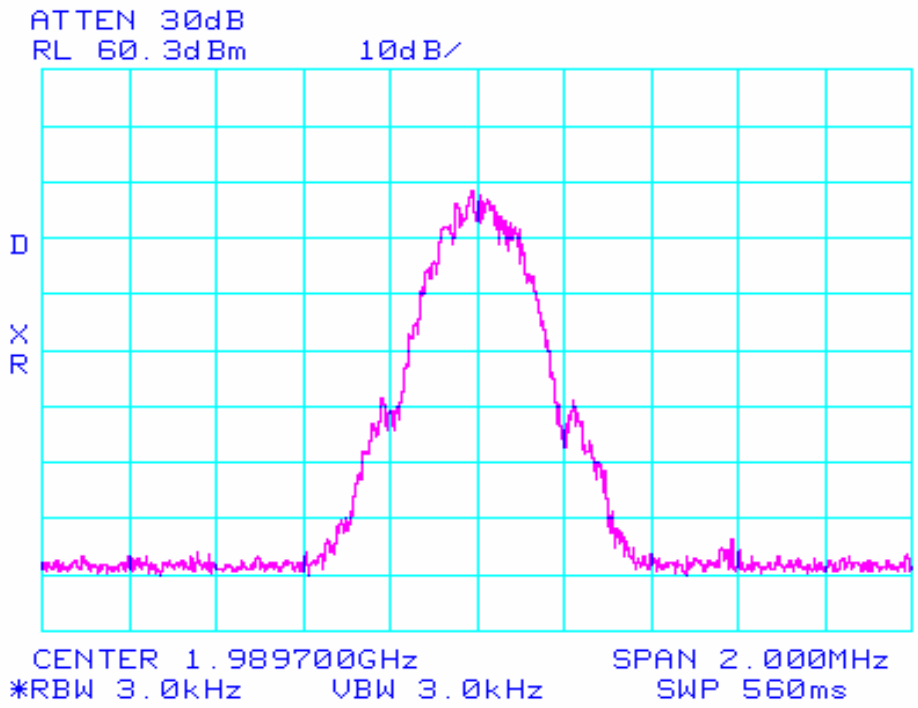
Data Plot **Occupied Bandwidth**

Page 3 of 4

Job No.: 3L0075R Date: 3/12/2004
Specification: PT 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 40
E.U.T.: DAC-1819-125
Configuration: TX FULL POWER



Notes: **OUTPUT, GSM, 62.5 watts**

Test Data – Occupied Bandwidth

Dallas Headquarters:
802 N. Kealy
Lewisville, TX 75057
Tel: (972) 436-9600
Fax: (972) 436-2667

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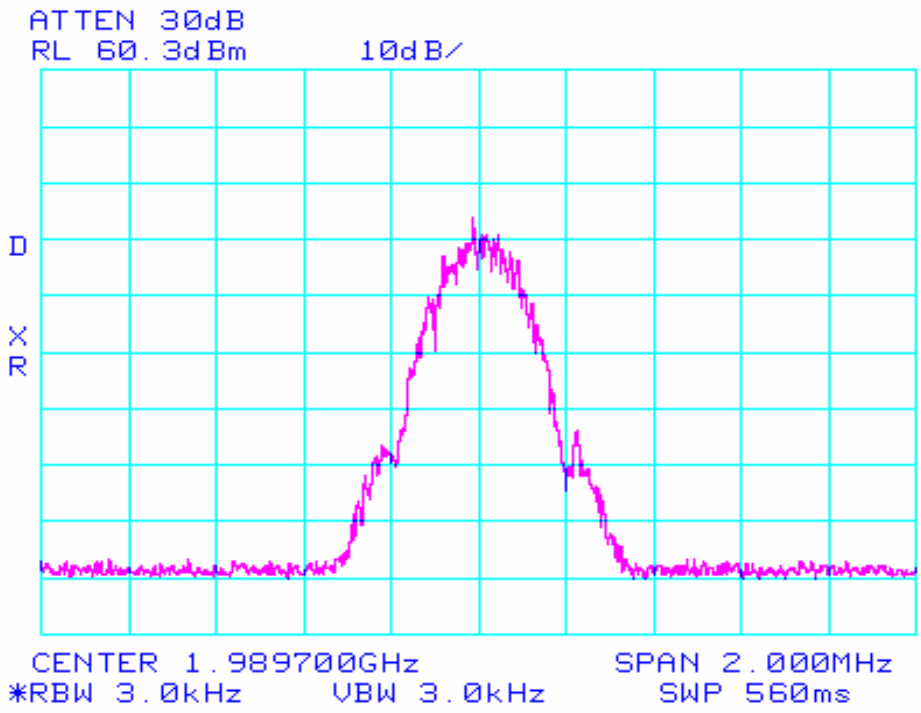
Test Plot: **Occupied Bandwidth**

Page 4 of 4

Job No.: 3L0075R Date: 3/12/2004
Specification: PT 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 40
E.U.T.: DAC-1819-125
Configuration: TX FULL POWER



Notes: **INPUT, GSM**

Section 5. Spurious Emissions at Antenna Terminals

NAME OF TEST: Spurious Emissions @ Antenna Terminals	PARA. NO.: 2.1051
TESTED BY: David Light	DATE: 3/12/04

Test Results: Complies.

Test Data: See attached plot(s).

Test Data – Spurious Emissions at Antenna Terminals

Dallas Headquarters:
802 N. Kealy
Lewisville, TX 75057
Tel: (972) 436-9600
Fax: (972) 436-2667

Nemko Dallas, Inc.

Data Plot **Spurious Emissions at Antenna Terminals**

Page 1 of 3 Complete X

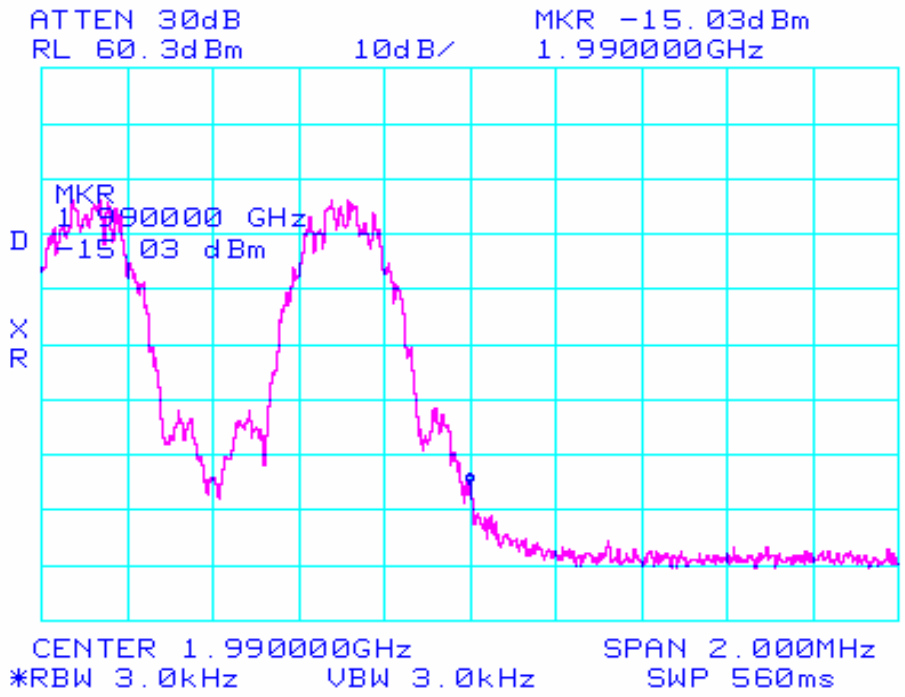
Job No.:	3L0075R	Date:	3/12/2004	Preliminary:	
Specification:	PT 24	Temperature(°C):	22		
Tested By:	David Light	Relative Humidity(%)	40		
E.U.T.:	DAC-1819-125				
Configuration:	TX FULL POWER				
Sample Number:	1				
Location:	Lab 2	RBW:	3 kHz	Measurement	
Detector Type:	Peak	VBW:	3 kHz	Distance:	NA m

Test Equipment Used

Antenna:		Directional Coupler:	1055
Pre-Amp:		Cable #1:	1626
Filter:		Cable #2:	
Receiver:	1464	Cable #3:	
Attenuator #1	1064	Cable #4:	
Attenuator #2:		Mixer:	

Additional equipment used:

Measurement Uncertainty: +/-1.7 dB



Notes: **Tx two carriers, 62.5 W (48 dBm) each, 1989.7 and 1989.1 MHz, GSM EDGE**
125 Watts (51 dBm) Composite power

Test Data – Spurious Emissions at Antenna Terminals

Dallas Headquarters:
802 N. Kealy
Lewisville, TX 75057
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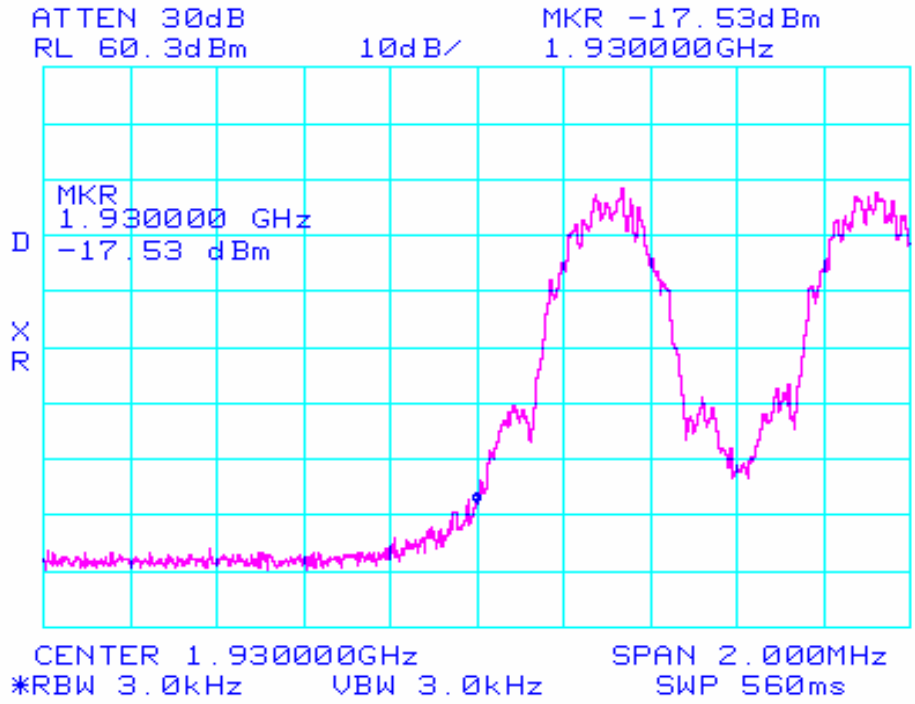
Nemko Dallas, Inc.

Data Plot **Spurious Emissions at Antenna Terminals**

Page ~~2~~ of 3

Job No.:	3L0075R	Date:	3/12/2004
Specification:	PT 24	Temperature(°C):	22
Tested By:	David Light	Relative Humidity(%)	40
E.U.T.:	DAC-1819-125		
Configuration:	TX FULL POWER		



Notes: **Tx two carriers, 62.5 W (48 dBm) each, 1930.3 and 1930.9 MHz, GSM EDGE**
125 Watts (51 dBm) Composite power

Test Data – Spurious Emissions at Antenna Terminals

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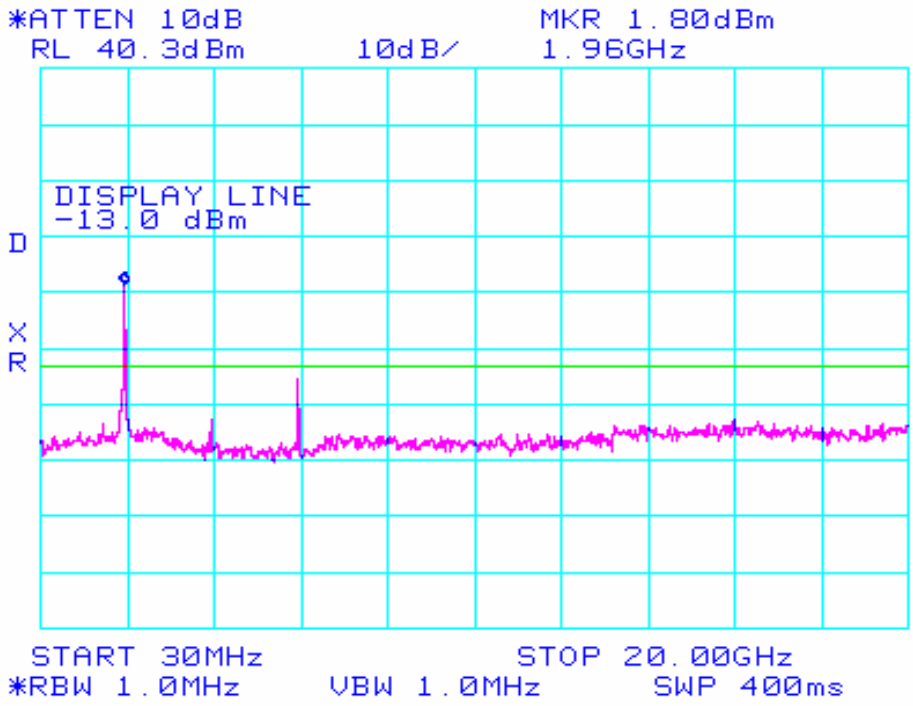
Data Plot **Spurious Emissions at Antenna Terminals**

Page 3 of 3

Job No.:	3L0075R	Date:	3/12/2004
Specification:	PT 24	Temperature(°C):	22
Tested By:	David Light	Relative Humidity(%)	40
E.U.T.:	DAC-1819-125		
Configuration:	TX FULL POWER		



Notes: **Transmit two carriers at 62.5 W each, 125 W composite, GSM EDGE**
Marker indicates carriers (NOTCHED)

Test Data – Spurious Emissions at Antenna Terminals

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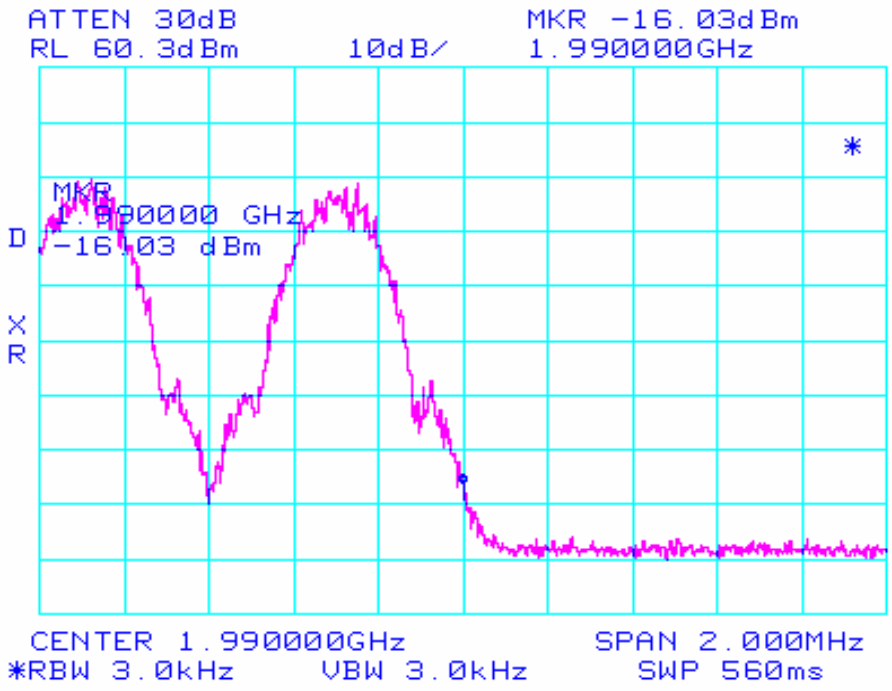
Data Plot **Spurious Emissions at Antenna Terminals**

Page 1 of 4 Complete ____

Job No.: 3L0075R Date: 3/12/2004 Preliminary: ____
Specification: PT24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 40
E.U.T.: DAC-1819-125
Configuration: TX FULL POWER
Sample Number: 1
Location: Lab 2 RBW: 3 kHz Measurement
Detector Type: Peak VBW: 3 kHz Distance: NA m

Test Equipment Used

Antenna: ____ Directional Coupler: 1055
Pre-Amp: ____ Cable #1: 1626
Filter: ____ Cable #2: ____
Receiver: 1464 Cable #3: ____
Attenuator #1 1064 Cable #4: ____
Attenuator #2: ____ Mixer: ____
Additional equipment used: ____
Measurement Uncertainty: +/-1.7 dB



Notes: **Tx two carriers, 62.5 W (48 dBm) each, 1989.7 and 1989.1 MHz, GSM**
125 Watts (51 dBm) Composite power

Test Data – Spurious Emissions at Antenna Terminals

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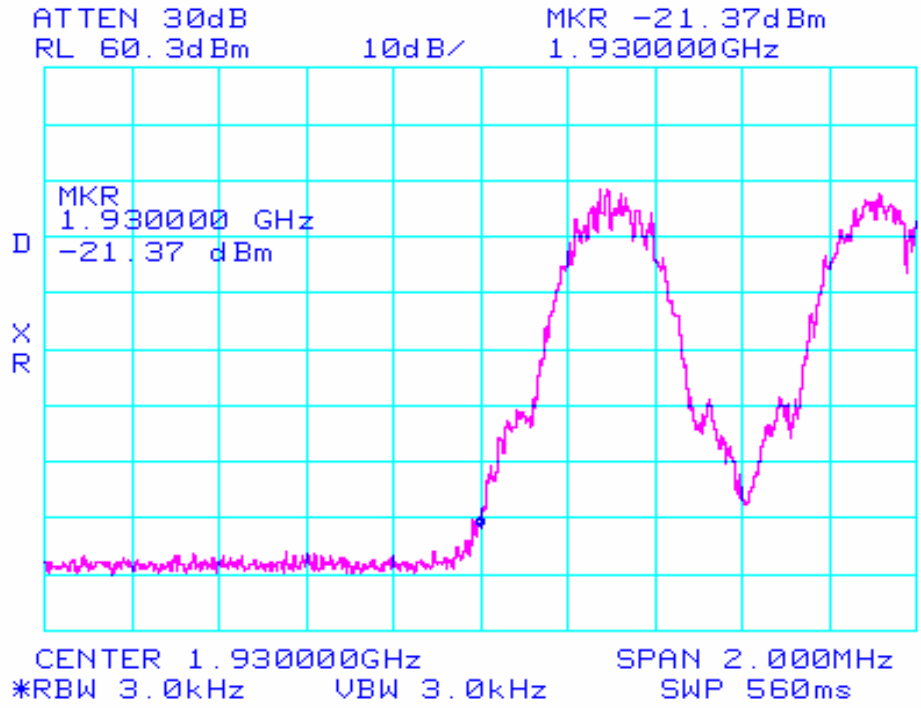
Data Plot **Spurious Emissions at Antenna Terminals**

Page ~~2~~ of 4

Job No.:	3L0075R	Date:	3/12/2004
Specification:	PT24	Temperature(°C):	22
Tested By:	David Light	Relative Humidity(%)	40
E.U.T.:	DAC-1819-125		
Configuration:	TX FULL POWER		



Notes: **Tx two carriers, 62.5 W (48 dBm) each, 1930.3 and 1930.9 MHz, GSM**
125 Watts (51 dBm) Composite power

Test Data – Spurious Emissions at Antenna Terminals

Dallas Headquarters:
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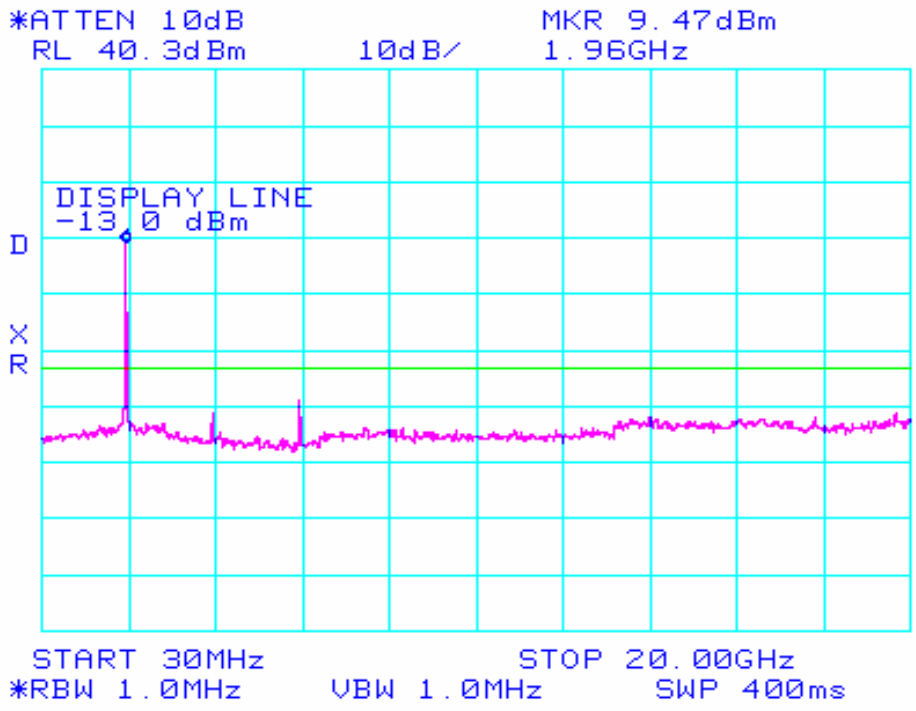
Fax: (972) 436-2667

Nemko Dallas, Inc.

Data Plot **Spurious Emissions at Antenna Terminals**

Page 3 of 4

Job No.:	3L0075R	Date:	3/12/2004
Specification:	PT24	Temperature(°C):	22
Tested By:	David Light	Relative Humidity(%)	40
E.U.T.:	DAC-1819-125		
Configuration:	TX FULL POWER		



Notes: **Transmit two carriers at 62.5 W each, 125 W composite, GSM**
Marker indicates carriers (NOTCHED)

Test Data – Band Edge at 1930.2, reduced power - GSM

Dallas Headquarters:
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Fax: (972) 436-2667

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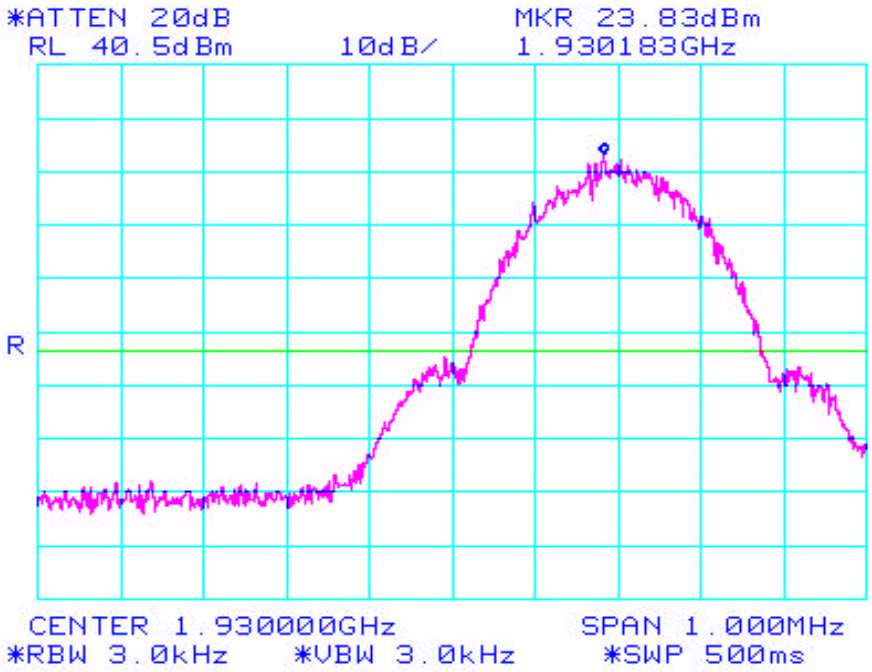
Data Plot **Spurious Emissions at Antenna Terminals**

Page 1 of 4 Complete X

Job No.: 3L0075R Date: 3/19/2004 Preliminary:
Specification: PT 24 Temperature(°C): 22
Tested By: Dustin Oaks Relative Humidity(%) 40
E.U.T.: CE-1819-100MC 100 WATT AMPLIFIER
Configuration: TX FULL POWER
Sample Number: 1
Location: Lab 2 RBW: 3 kHz Measurement
Detector Type: Peak VBW: 3 kHz Distance: NA m

Test Equipment Used

Antenna: Directional Coupler: 1055
Pre-Amp: Cable #1: 1626
Filter: Cable #2: 1987
Receiver: 1464 Cable #3:
Attenuator #1 1064 Cable #4:
Attenuator #2: Mixer:
Additional equipment used:
Measurement Uncertainty: +/-1.7 dB



Notes: **GSM-Tx single carrier 1930.2 MHz Power Reduced to comply with bandedge**

Test Data – Band Edge at 1989.8, reduced power – GSM

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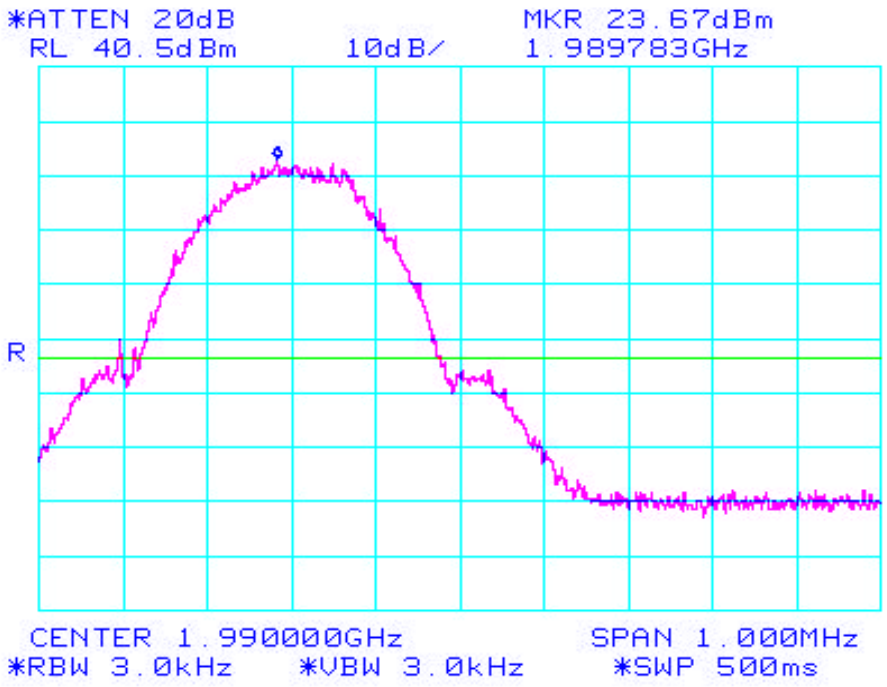
Tel: (972) 436-9600
Fax: (972) 436-2667

Nemko Dallas, Inc.

Data Plot **Spurious Emissions at Antenna Terminals**

Page 2 of 4

Job No.:	3L0075R	Date:	3/19/2004
Specification:	PT 24	Temperature(°C):	22
Tested By:	Dustin Oaks	Relative Humidity(%)	40
E.U.T.:	CE-1819-100MC 100 WATT AMPLIFIER		
Configuration:	TX FULL POWER		



Notes: GSM-Tx single carrier 1989.8 MHz Power Reduced to comply with bandedge

Test Data – Band Edge at 1930.2, reduced power - EDGE

Dallas Headquarters:
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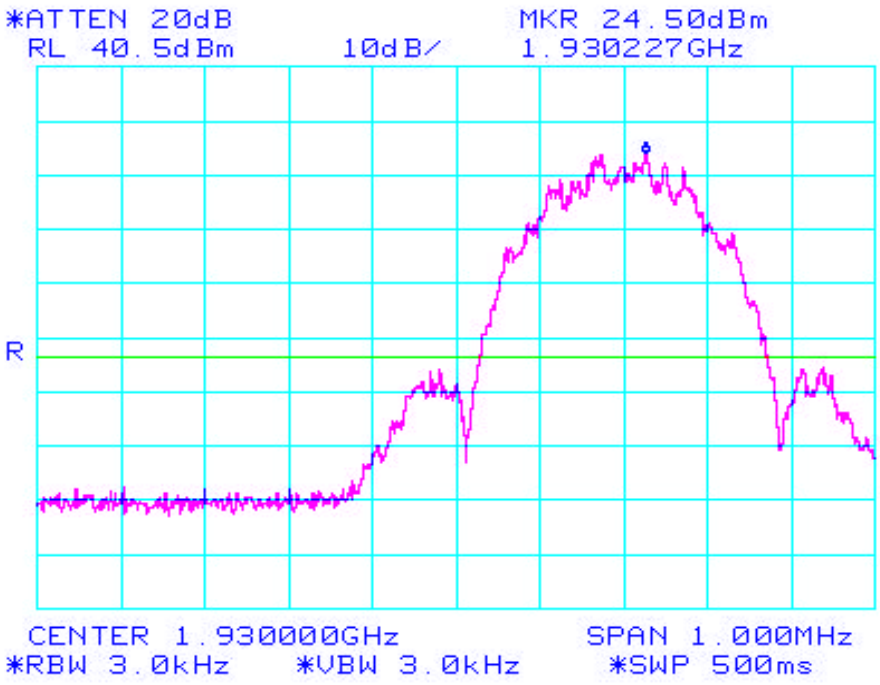
Lewisville, TX 75057
Tel: (972) 436-9600
Fax: (972) 436-2667

Nemko Dallas, Inc.

Data Plot **Spurious Emissions at Antenna Terminals**

Page 3 of 4

Job No.:	3L0075R	Date:	3/19/2004
Specification:	PT 24	Temperature(°C):	22
Tested By:	Dustin Oaks	Relative Humidity(%)	40
E.U.T.:	CE-1819-100MC 100 WATT AMPLIFIER		
Configuration:	TX FULL POWER		



Notes: EDGE-Tx single carrier 1930.2 MHz Power Reduced to comply with bandedge

Test Data – Band Edge at 1989.8, reduced power – EDGE

Dallas Headquarters:
802 N. Kealy
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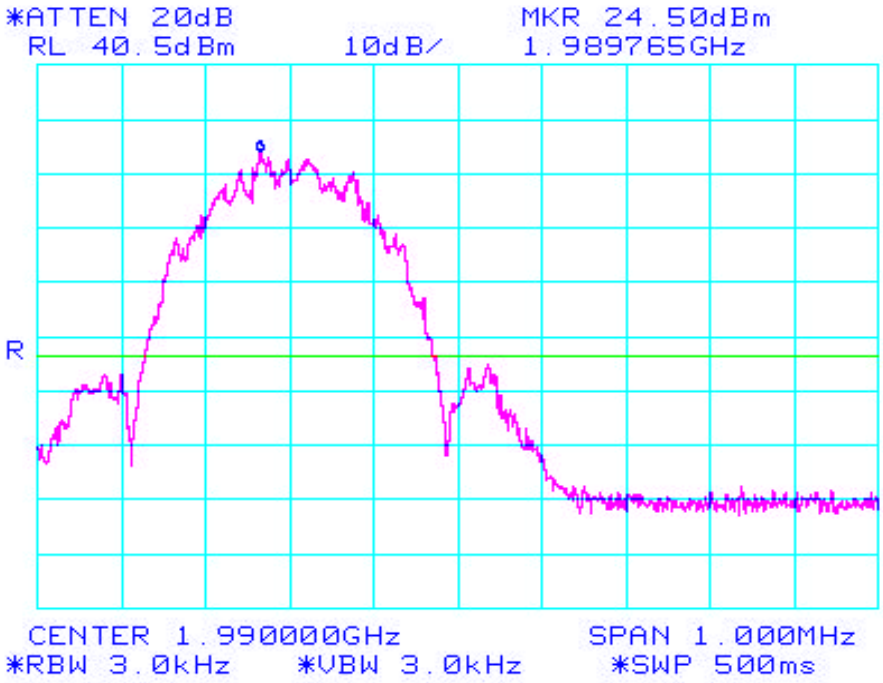
Tel: (972) 436-9600
Fax: (972) 436-2667

Nemko Dallas, Inc.

Test Plot: **Spurious Emissions at Antenna Terminals**

Page 4 of 4

Job No.:	3L0075R	Date:	3/19/2004
Specification:	PT 24	Temperature(°C):	22
Tested By:	Dustin Oaks	Relative Humidity(%)	40
E.U.T.:	CE-1819-100MC 100 WATT AMPLIFIER		
Configuration:	TX FULL POWER		



Notes: EDGE-Tx single carrier 1989.8 MHz Power Reduced to comply with bandedge

Section 6. Field Strength of Spurious

NAME OF TEST: Field Strength of Spurious Emissions	PARA. NO.: 2.1051
TESTED BY: David Light	DATE: 3/12/04

Test Results: Complies.

Test Data: See attached table.

Test Data - Radiated Spurious Emissions

Dallas Headquarters:
802 N. Kealy
Lewisville, TX 75057
Tel: (972) 436-9600
Fax: (972) 436-2667

Nemko Dallas, Inc.

EIRP Substitution

Page 1 of 1 Complete X

Job No.: 4L0134R Date: 3/12/04 Preliminary

Specification: PT24 Temperature(°C): 22

Tested By: David Light Relative Humidity(%) 40

E.U.T.: DAB-1819-125

Configuration: Tx FULL POWER CW INTO LOAD

Sample No: 1

Location: AC 3 RBW: 1 MHz Measurement

Detector Type: Peak VBW: 1 MHz Distance: 3 m

Test Equipment Used

Antenna: 1304 Directional Coupler:

Pre-Amp: 1016 Cable #1: 1484

Filter: 1059 Cable #2: 1485

Receiver: 1464 Cable #3:

Attenuator #1 Cable #4:

Attenuator #2: Mixer:

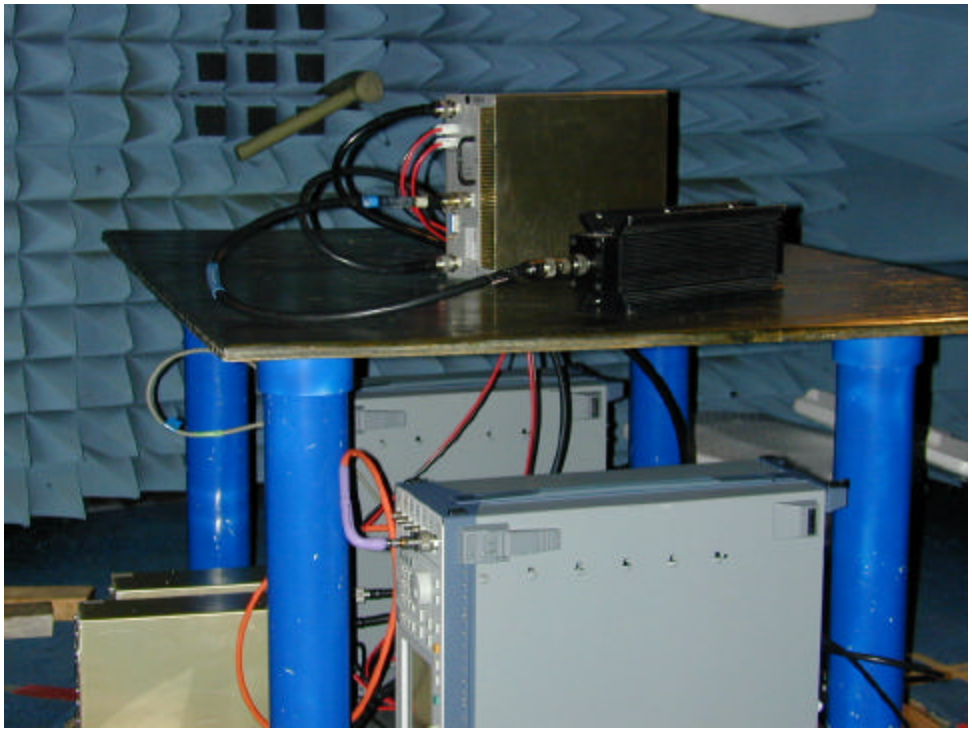
Additional equipment used:

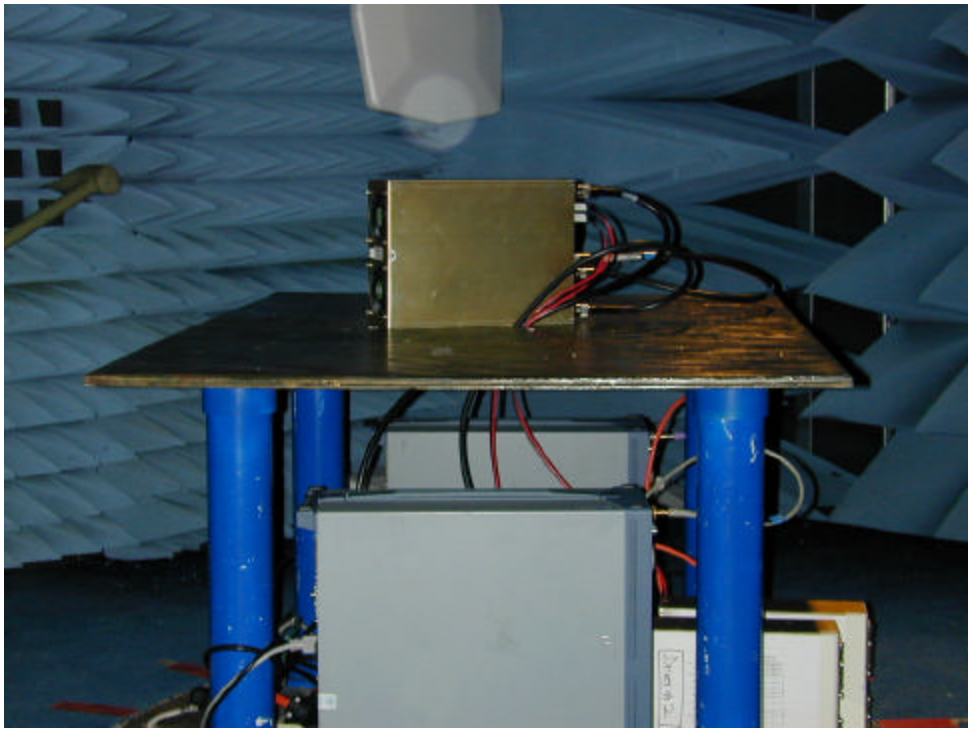
Measurement Uncertainty: +/-1.7 dB

Frequency (MHz)	Meter Reading (dBm)	Substitution Level (dBm)		Pre-Amp Gain (dB)	Substitution Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarity	Comments
5880	-33.0	-24.8		31.6	9.3	-24.8	-13.0	-11.7667	V	
7840	-42.7	-33.8		32.9	9.2	-33.8	-13.0	-20.7667	V	
9800	-56.3	-49.0		34.5	10.3	-49.0	-13.0	-35.9667	V	
5880	-38.7	-32.5		31.6	9.3	-32.5	-13.0	-19.4667	H	
7840	-39.3	-30.7		32.9	9.2	-30.7	-13.0	-17.7000	H	
9800	-57.8	-49.0		34.5	10.3	-49.0	-13.0	-35.9667	H	

Notes: **Tx full power at 1960 and 1960.3 MHz**
No emissions were detected other than those reported. Noise floor was at least 20 dB below spec limit

Photographs of Test Setup





Section 7. Test Equipment List

Nemko ID	Description	Manufacturer Model Number	Serial Number	Calibration Date	Calibration Due
1464	Spectrum analyzer	Hewlett Packard 8563E	3551A04428	02/11/03	02/11/05
1016	Pre-Amp	HEWLETT PACKARD 8449A	2749A00159	10/27/03	10/26/04
1304	HORN ANTENNA	ELECTRO METRICS RGA-60	6151	09/22/03	09/22/05
1484	Cable 2.0-18.0 Ghz	Storm PR90-010-072	N/A	07/24/03	07/23/04
1485	Cable 2.0-18.0 Ghz	Storm PR90-010-216	N/A	07/24/03	07/23/04
1055	DUAL DIRECTIONAL COUPLER	NARDA 3022	73393	CBU	N/A
1626	CABLE, 5 ft	MEGAPHASE 10311 1GVT4	N/A	CBU	N/A
1064	ATTENUATOR	NARDA 776B-20	NONE	CBU	N/A

ANNEX A - TEST DETAILS

NAME OF TEST: RF Power Output	**PARA. NO.: 2.1046**

Minimum Standard: Para. No.24.232. Base stations are limited to 1640 watts peak E.I.R.P. with an antenna height up to 300 meters HAAT. In no case may the peak output power of a base station transmitter exceed 100 watts.

Method Of Measurement:

Detachable Antenna:
The peak power at antenna terminals is measured using an in-line peak power meter. Power output is measured with the maximum rated input level.

NAME OF TEST: Occupied Bandwidth **PARA. NO.: 2.1047**

Minimum Standard: Para. No. 24.238(b). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB.

Method Of Measurement:

CDMA

Spectrum analyzer settings:
RBW: 30 kHz
VBW: ? RBW
Span: 5 MHz
Sweep: Auto
Mask: Set markers to -26 dB from peak of CW.

GSM

RBW: 3 kHz
VBW: ? RBW
Span: 2 MHz
Sweep: Auto
Mask: Set markers to -26 dB from peak of CW.

NADC

RBW: 1 kHz
VBW: ? RBW
Span: 1 MHz
Sweep: Auto
Mask: Set markers to -26 dB from peak of CW.

NAME OF TEST: Spurious Emission at Antenna Terminals **PARA. NO.: 2.1051**

Minimum Standard: Para. No.24.238(a). On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power by at least 43 + 10 log (P) dB.

Method Of Measurement:

Spectrum analyzer settings:

CDMA

RBW: 1 MHz (> 1 MHz from Band Edge)
RBW: 30 kHz (< 1MHz from Band Edge)
VBW: ? RBW
Sweep: Auto
Video Avg: 6 Sweeps

GSM

RBW: 1 MHz (> 1 MHz from Band Edge)
RBW: 3 kHz (< 1 MHz from Band Edge)
VBW: ? RBW
Sweep: Auto
Video Avg: Disabled

NADC

RBW: 1 MHz (> 1 MHz from Band Edge)
RBW: 3 kHz (< 1 MHz from Band Edge)
VBW: ? RBW
Sweep: Auto
Video Avg: Disabled

To demonstrate compliance at band edges the frequency of the input signal is set to the lowest and highest assigned channel and the center frequency of the spectrum analyzer is set to the upper and lower edges of the appropriate frequency block.

NAME OF TEST: Field Strength of Spurious Radiation PARA. NO.: 2.1053

Minimum Standard: Para. No.24.238(a). On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power by at least 43 + 10 log (P) dB.

Test Method:

The antenna substitution method was used. This method is described in EIA/TIA 603B.

NAME OF TEST: Frequency Stability	**PARA. NO.: 2.1055**

Minimum Standard: Para. No. 24.235. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Method Of Measurement:

Frequency Stability With Voltage Variation

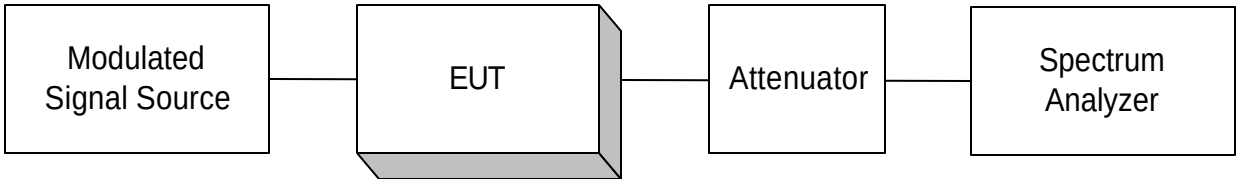
The E.U.T. is placed in an environmental chamber and allowed to stabilize at +20 degrees Celsius for at least 15 minutes. The frequency counter and signal generator are phase locked with the same 10 MHz reference frequency by connecting the 10 MHz ref. out of the counter to the 10 MHz ref, in of the signal generator. With the voltage input to the E.U.T. set to 85% S.T.V., the frequency is measured in 30 second intervals for a period of 5 minutes. This procedure is repeated at 100% S.T.V. and 115% S.T.V.

Frequency Stability With Temperature Variation

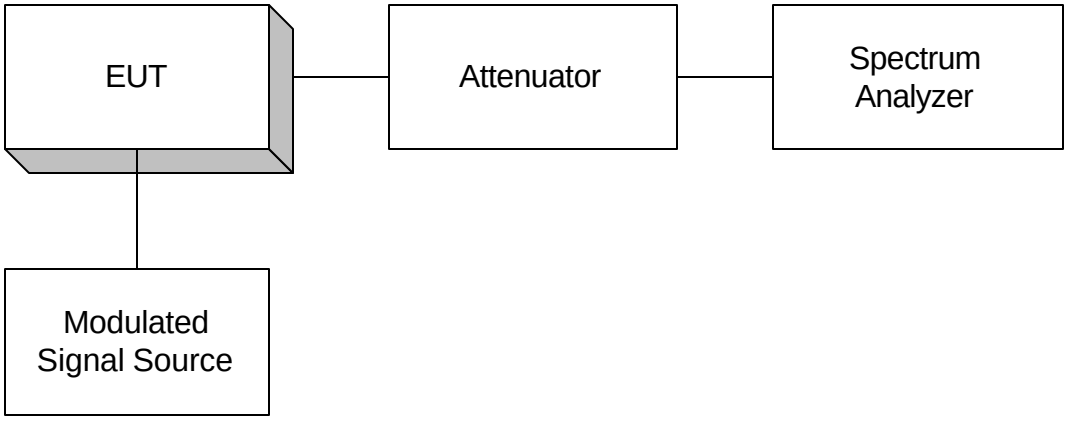
The input voltage to the E.U.T. is set to S.T.V. and the temperature of the environmental chamber is varied in 10 degree steps from -30 degrees C to +50 degrees C. The E.U.T. is allowed to stabilize at each temperature and the frequency is measured in 30 second intervals for a period of 5 minutes.

ANNEX B - TEST DIAGRAMS

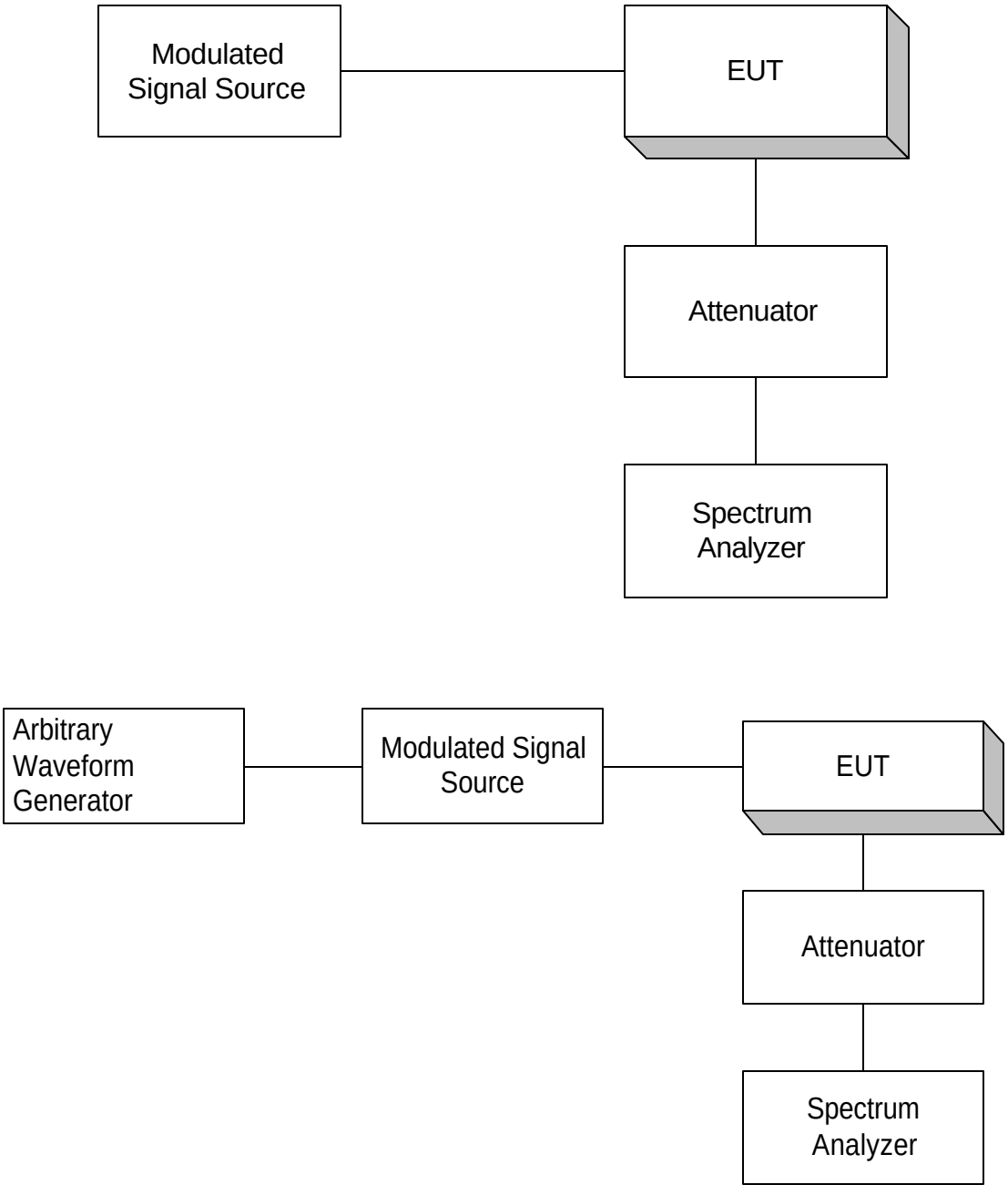
Para. No. 2.985 - R.F. Power Output



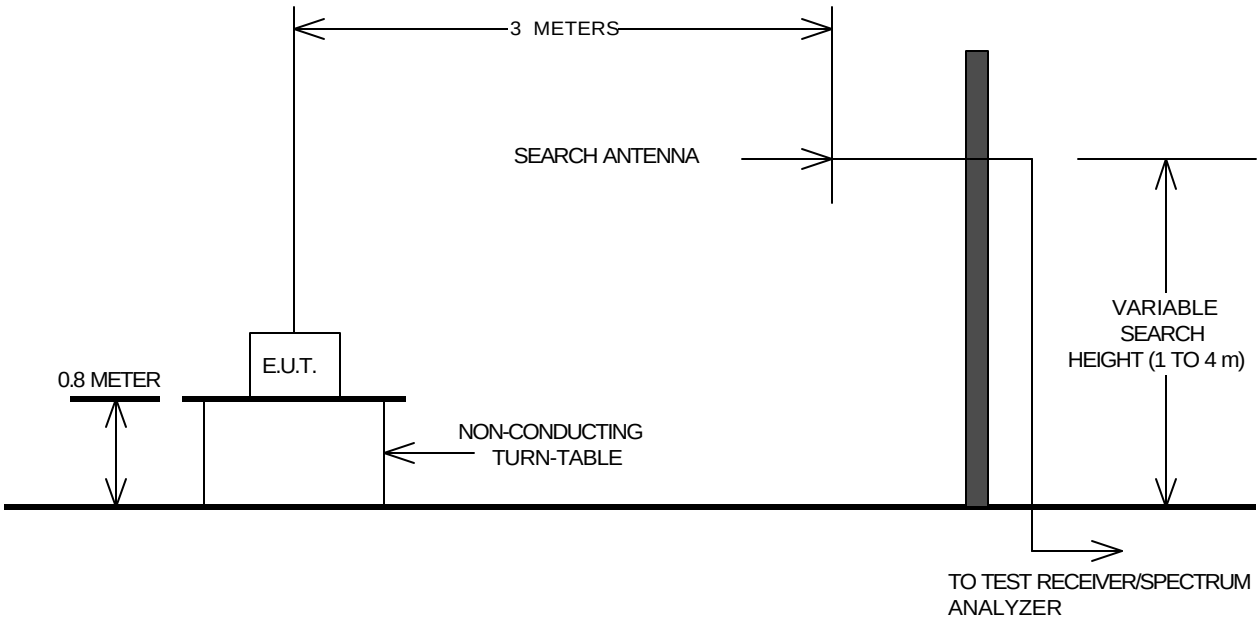
Para. No. 2.989 - Occupied Bandwidth



Para. No. 2.991 Spurious Emissions at Antenna Terminals



Para. No. 2.993 - Field Strength of Spurious Radiation



Para. No. 2.995 - Frequency Stability