

Nemko Test Report: 1L0456RUS1

Applicant: GTRAN Wireless

Equipment Under Test:
(E.U.T.) GPC-2100 PCS Band modem

FCC ID: PL5GPC-2100

In Accordance With: **FCC Part 24, Subpart E**
Broadband PCS Subscriber Station

Tested By: Nemko Dallas Inc.
802 N. Kealy
Lewisville, TX
75057-3136

Authorized By: 
Tom Tidwell, RF Group Manager

Date: 9/26/01

Total Number of Pages: 32

Nemko Dallas

FCC PART 24, SUBPART E

BROADBAND PCS SUBSCRIBER STATION

EQUIPMENT: GPC-2100

FCC ID: PL5GPC-2100

PROJECT NO.:

1L0456RUS1

Table of Contents

Section 1.	Summary of Test Results	3
Section 2.	General Equipment Specification.....	5
Section 3.	RF Power Output.....	7
Section 4.	Occupied Bandwidth.....	8
Section 5.	Spurious Emissions at Antenna Terminals	12
Section 6.	Field Strength of Spurious.....	17
Section 7.	Frequency Stability	20
ANNEX A - TEST METHODOLOGIES.....		23
ANNEX B - TEST DIAGRAMS		29

Nemko Dallas

FCC PART 24, SUBPART E

BROADBAND PCS SUBSCRIBER STATION

EQUIPMENT: GPC-2100

FCC ID: PL5GPC-2100

PROJECT NO.:

1L0456RUS1

Section 1. Summary of Test Results

Manufacturer: GTRAN

Model No.: GPC-2100

Serial No.: S01

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.

See "Summary of Test Data".



NVLAP LAB CODE: 100426-0

Nemko Dallas Inc. authorizes the above named company to reproduce this report provided it is reproduced in its entirety and for use by the company's employees only.

Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. Nemko Dallas Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

This report applies only to the items tested.

Nemko Dallas

FCC PART 24, SUBPART E

BROADBAND PCS SUBSCRIBER STATION

EQUIPMENT: GPC-2100

FCC ID: PL5GPC-2100

PROJECT NO.:

1L0456RUS1

Summary Of Test Data

NAME OF TEST	PARA. NO.	SPEC.	RESULT
RF Power Output	24.232	100W	Complies
Occupied Bandwidth (CDMA)	24.238		Complies
Occupied Bandwidth (GSM)	24.238	N/A	N/A
Occupied Bandwidth (NADC)	24.238	N/A	N/A
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	± 0.05 ppm	Complies

Footnotes:

This device supports CDMA only.

Nemko Dallas

FCC PART 24, SUBPART E

BROADBAND PCS SUBSCRIBER STATION

EQUIPMENT: GPC-2100

FCC ID: PL5GPC-2100

PROJECT NO.:

1L0456RUS1

Section 2. General Equipment Specification

Frequency Bands:	<input checked="" type="checkbox"/> Block A : 1850 – 1865 MHz <input checked="" type="checkbox"/> Block B : 1865 – 1870 MHz <input checked="" type="checkbox"/> Block C : 1870 – 1885 MHz <input checked="" type="checkbox"/> Block D : 1885 – 1890 MHz <input checked="" type="checkbox"/> Block E : 1890 – 1895 MHz <input checked="" type="checkbox"/> Block F : 1895 – 1910 MHz
Output Impedance:	50 ohms
RF Output (Rated):	0..269 W

Nemko Dallas

FCC PART 24, SUBPART E

BROADBAND PCS SUBSCRIBER STATION

EQUIPMENT: GPC-2100

FCC ID: PL5GPC-2100

PROJECT NO.:

1L0456RUS1

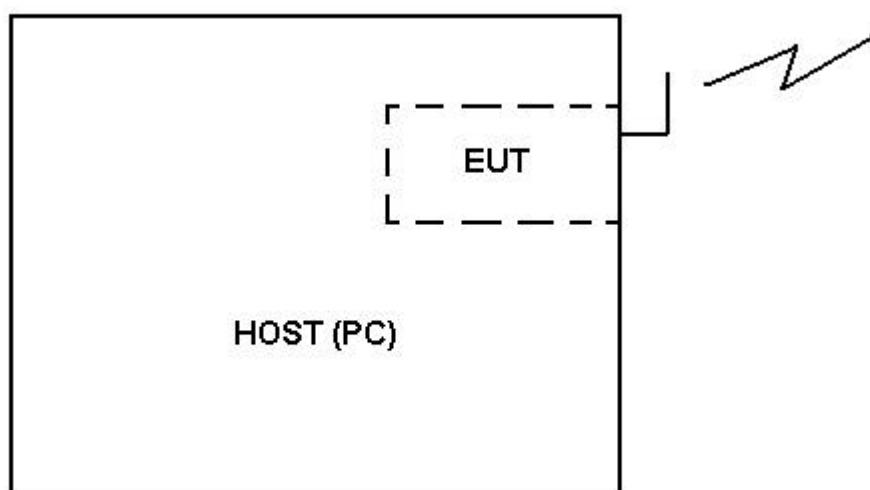
System Description

M/A-COM's MD59-0049 integrated downconverter combines a low noise amplifier, RF amplifier, mixer, IF amplifier, and LO buffer in a miniature 4 millimeter plastic MLF package that has an exposed backside for improved high frequency grounding.

M/A-COM designed the MD59-0049 for applications requiring high linearity wide dynamic range and low power consumption. By application of a suitable control voltage to pin 13, the linearity of the device can be controlled in real time to keep the current as low as possible.

M/A-COM fabricates the MD59-0049 using a 0.5 micron low noise E/D GaAs MESFET process. The process features full passivation for increased performance and reliability.

System Diagram



Nemko Dallas

FCC PART 24, SUBPART E

BROADBAND PCS SUBSCRIBER STATION

EQUIPMENT: GPC-2100

FCC ID: PL5GPC-2100

PROJECT NO.:

1L0456RUS1

Section 3. RF Power Output

NAME OF TEST: RF Power Output

PARA. NO.: 2.1046

TESTED BY: David Light

DATE: 8/30/2001

Test Results: Complies.

Measurement Data:

Modulation Type	Channel	Output Power (dBm)	Output Power (W)
CDMA	25	24.0	0.250
CDMA	600	24.1	0.257
CDMA	1175	24.3	0.269

Nemko Dallas

FCC PART 24, SUBPART E

BROADBAND PCS SUBSCRIBER STATION

EQUIPMENT: GPC-2100

PL5GPC-2100

PROJECT NO.:

1L0456RUS1

Section 4. Occupied Bandwidth

NAME OF TEST: Occupied Bandwidth (CDMA)	PARA. NO.: 2.1047
TESTED BY: David Light	DATE: 8/30/01

Test Results: Complies.

Test Data: See attached plots.

Nemko Dallas

FCC PART 24, SUBPART E

BROADBAND PCS SUBSCRIBER STATION

EQUIPMENT: GPC-2100

FCC ID: PL5GPC-2100

PROJECT NO.:

1L0456RUS1



Nemko Dallas, Inc.

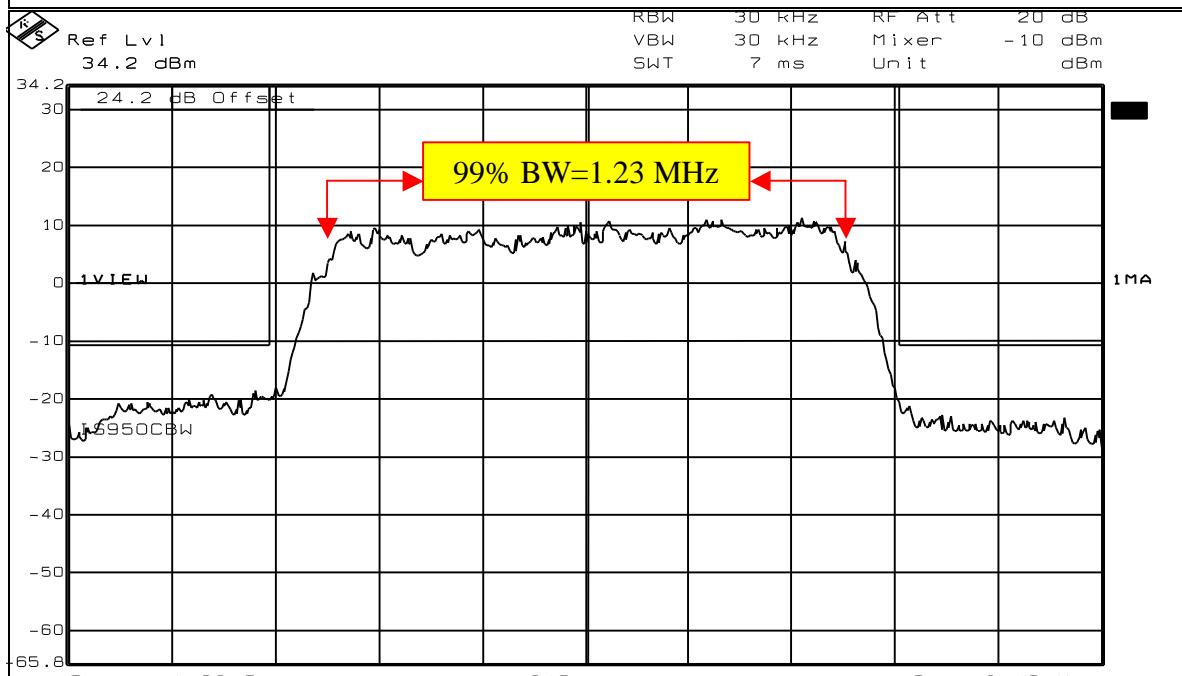
Dallas Headquarters:

802 N. Kealy

Lewisville, TX 75057

Tel: (972) 436-9600

Fax: (972) 436-2667

Data Plot		Occupied Bandwidth	
Page 1 of 1		Complete <input checked="" type="checkbox"/> X	
Job No.:	1L0456R	Date:	8/30/01
Specification:	Part 24	Temperature(°C):	22
Tested By:	David Light	Relative Humidity(%):	50
E.U.T.:	PCS PCMCIA Modem		
Configuration:	Installed in Laptop ber typical configuration		
Sample Number:	9		
Location:	Lab 1	RBW:	Refer to plots
Detector Type:	Peak	VBW:	Refer to plots
		Measurement	
		Distance:	N/A m
Test Equipment Used			
Antenna:	Directional Coupler:		
Pre-Amp:	Cable #1: 1045		
Filter:	Cable #2:		
Receiver:	Cable #3:		
Attenuator #1	Cable #4:		
Attenuator #2:	Mixer:		
Additional equipment used:			
Measurement Uncertainty: +/-1.7 dB			
			
Notes:	Channel 600		

Nemko Dallas

FCC PART 24, SUBPART E

BROADBAND PCS SUBSCRIBER STATION

EQUIPMENT: GPC-2100

PL5GPC-2100

FCC ID:

PROJECT NO.:

1L0456RUS1

NAME OF TEST: Occupied Bandwidth (GSM)

REV. NO.: 2.1049

TESTED BY:

DATE:

Test Results:

Complies.

Not Applicable

Test Data: See attached plots.

Nemko Dallas

FCC PART 24, SUBPART E

BROADBAND PCS SUBSCRIBER STATION

EQUIPMENT: GPC-2100

FCC ID: PL5GPC-2100

PROJECT NO.:

1L0456RUS1

NAME OF TEST: Occupied Bandwidth (NADC)

PARA. NO.: 2.1049

TESTED BY:

DATE:

Test Results:

Complies.

Test Data:

See attached document

Not Applicable

Nemko Dallas

FCC PART 24, SUBPART E

BROADBAND PCS SUBSCRIBER STATION

EQUIPMENT: GPC-2100

FCC ID: PL5GPC-2100

PROJECT NO.:

1L0456RUS1

Section 5. Spurious Emissions at Antenna Terminals

NAME OF TEST: Spurious Emissions @ Antenna Terminals	PARA. NO.: 2.1051
--	-------------------

TESTED BY: David Light	DATE: 8/30/01
------------------------	---------------

Test Results: Complies.

Test Data: See attached plots

Nemko Dallas

FCC PART 24, SUBPART E

BROADBAND PCS SUBSCRIBER STATION

EQUIPMENT: GPC-2100

FCC ID: PL5GPC-2100

PROJECT NO.: 1L0456RUS1



Nemko Dallas, Inc.

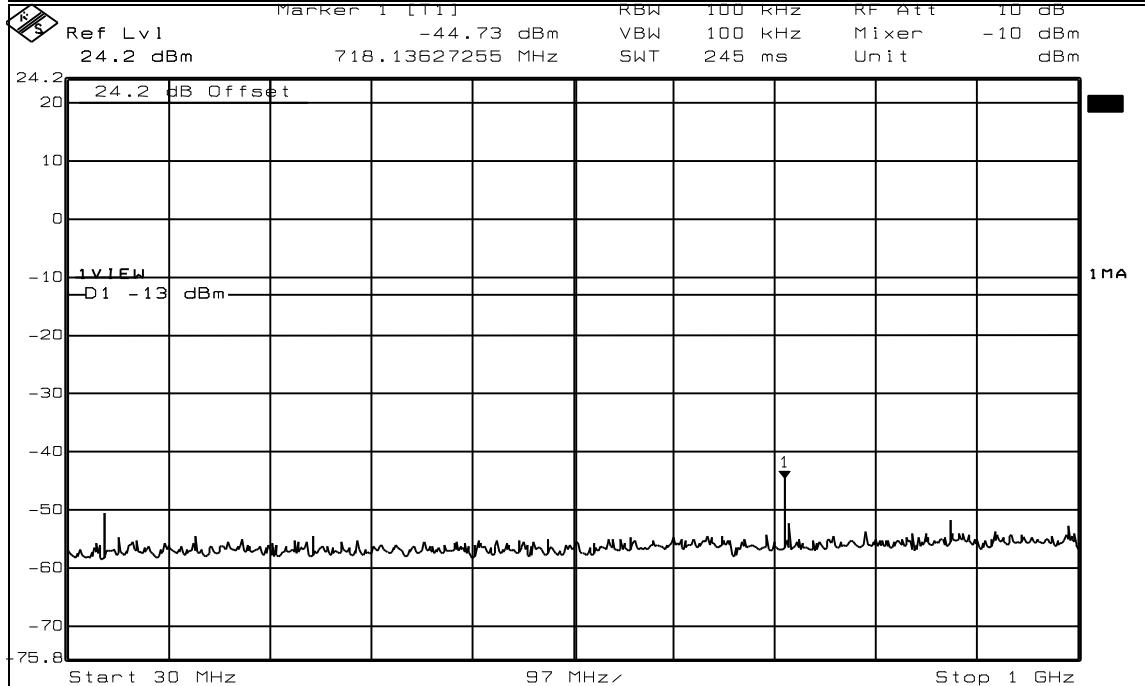
Dallas Headquarters:

802 N. Kealy

Lewisville, TX 75057

Tel: (972) 436-9600

Fax: (972) 436-2667

Data Plot		Spurious Emissions at Antenna Terminal			
Page <u>1</u> of 2					
Job No.:	1L0456R	Date:	8/30/01		
Specification:	Part 24	Temperature(°C):	22		
Tested By:	David Light	Relative Humidity(%):	50		
E.U.T.:	PCS PCMCIA Modem				
Configuration:	Installed in laptop per typical installation				
Sample Number:	9	RBW:	Refer to plots		
Location:	Lab 1	Measurement			
Detector Type:	Peak	VBW:	Refer to plots		
		Distance:	N/A m		
Test Equipment Used					
Antenna:	Directional Coupler:				
Pre-Amp:	Cable #1: 1045				
Filter:	Cable #2:				
Receiver:	Cable #3:				
Attenuator #1	Cable #4:				
Attenuator #2:	Mixer:				
Additional equipment used:					
Measurement Uncertainty:	+/-1.7 dB				
					
Date:	30.AUG.2001 10:13:58				
Notes:	Transmit full power at channel 600				

Nemko Dallas**FCC PART 24, SUBPART E****BROADBAND PCS SUBSCRIBER STATION**

EQUIPMENT: GPC-2100
FCC ID: PL5GPC-2100

PROJECT NO.: 1L0456RUS1**Nemko Dallas, Inc.****Dallas Headquarters:**

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

Data Plot		Bandedges			
Page <u>1</u> of 2				Complete <input checked="" type="checkbox"/> X	
Job No.:	1L0456R	Date:	8/30/01	Preliminary	<input type="checkbox"/>
Specification:	Part 24	Temperature(°C):	22		
Tested By:	David Light	Relative Humidity(%)	50		
E.U.T.:	PCS PCMCIA Modem				
Configuration:	Installed in laptop per typical configuration				
Sample Number:	9				
Location:	Lab 1	RBW:	Refer to plots	Measurement	
Detector Type:	Peak	VBW:	Refer to plots	Distance:	N/A m
Test Equipment Used					
Antenna:	Directional Coupler:				
Pre-Amp:	Cable #1: 1045				
Filter:	Cable #2:				
Receiver:	Cable #3:				
Attenuator #1	Cable #4:				
Attenuator #2:	Mixer:				
Additional equipment used:					
Measurement Uncertainty: +/-1.7 dB					
Date: 30.AUG.2001 9:27:37					
Notes: Lower bandedge Channel 25					

Nemko Dallas

FCC PART 24, SUBPART E

BROADBAND PCS SUBSCRIBER STATION

EQUIPMENT: GPC-2100

FCC ID: PL5GPC-2100

PROJECT NO.: 1L0456RUS1



Nemko Dallas, Inc.

Dallas Headquarters:

802 N. Kealy

Lewisville, TX 75057

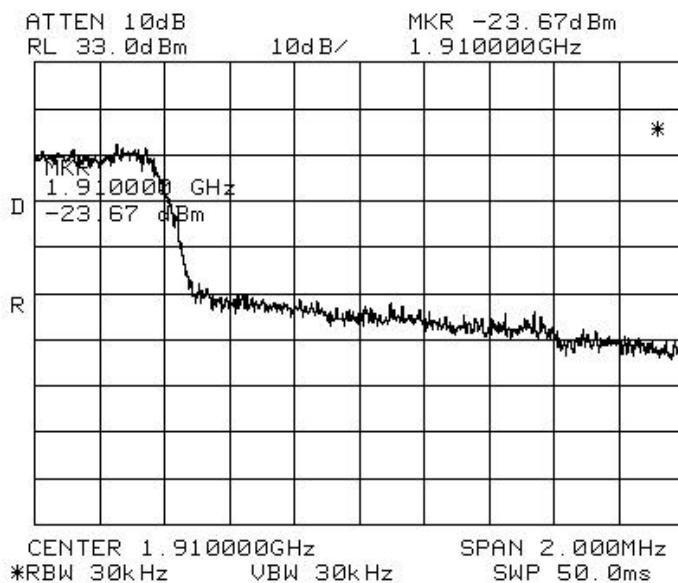
Tel: (972) 436-9600

Fax: (972) 436-2667

Data Plot Bandedges

Page 2 of 2

Job No.: 1L0456R Date: 8/30/01
Specification: Part 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 50
E.U.T.: PCS PCMCIA Modem
Configuration: Installed in laptop per typical configuration



Notes: Upper bandedge
Channel 1175

Nemko Dallas

FCC PART 24, SUBPART E

BROADBAND PCS SUBSCRIBER STATION

EQUIPMENT: GPC-2100

FCC ID: PL5GPC-2100

PROJECT NO.: 1L0456RUS1



Dallas Headquarters:

802 N. Kealy

Lewisville, TX 75057

Tel: (972) 436-9600

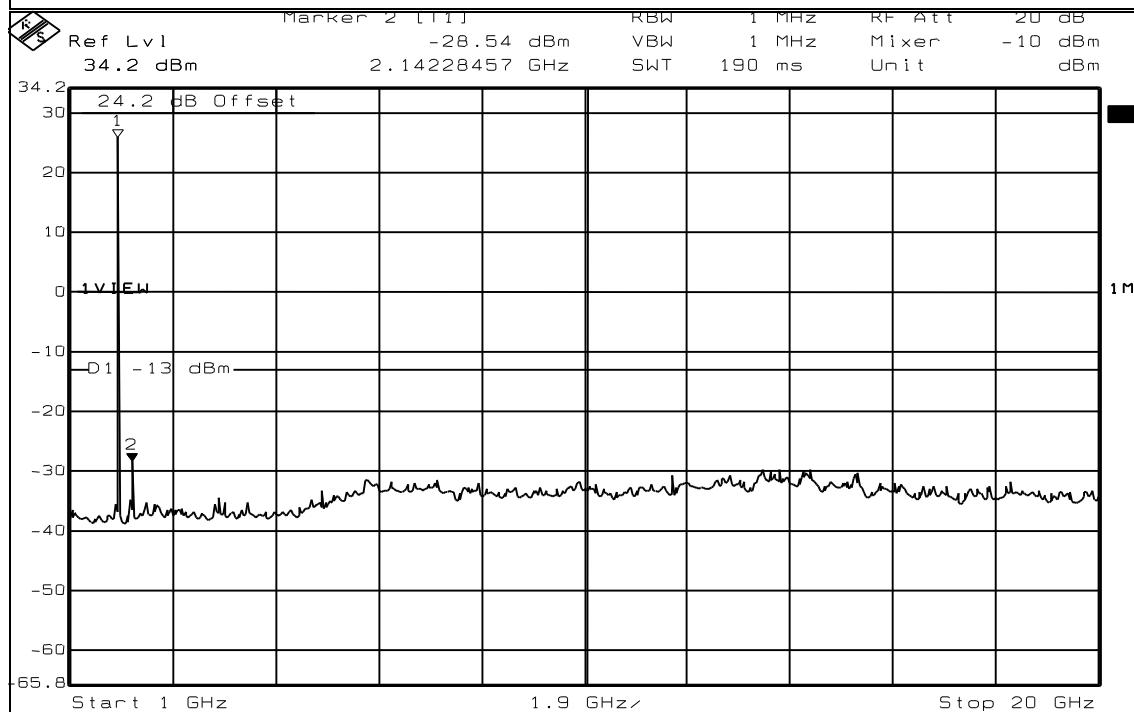
Fax: (972) 436-2667

Nemko Dallas, Inc.

Data Plot Spurious Emissions at Antenna Terminal

Page 2 of 2

Job No.: 1L0456R Date: 8/30/01
Specification: Part 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 50
E.U.T.: PCS PCMCIA Modem
Configuration: Installed in laptop per typical installation



Notes: Transmit full power at channel 600

Marker 1 indicates carrier

Marker 2 indicates highest emission

Nemko Dallas

FCC PART 24, SUBPART E

BROADBAND PCS SUBSCRIBER STATION

EQUIPMENT: GPC-2100

FCC ID: PL5GPC-2100

PROJECT NO.:

1L0456RUS1

Section 6. Field Strength of Spurious

NAME OF TEST: Field Strength of Spurious

PARA. NO.: 2.1053

TESTED BY:

DATE:

Test Results: Complies.

Test Data: See attached table.

Nemko Dallas**FCC PART 24, SUBPART E****BROADBAND PCS SUBSCRIBER STATION****EQUIPMENT:****GPC-2100****FCC ID:****PL5GPC-2100****PROJECT NO.:****1L0456RUS1****Test Data - Radiated Emissions**

Nemko Dallas, Inc.

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

Field Strength of Spurious Emissions										
Page <u>1</u> of <u>1</u>									Complete <u>X</u>	
Job No.: <u>1L0456</u>			Date: <u>9/4/01</u>						Preliminary _____	
Specification: <u>Temperature(°C): 22</u>										
Tested By: <u>Lance Walker</u>			Relative Humidity(%): <u>50</u>							
E.U.T.: <u>WIRELESS MODEM</u>										
Configuration: <u>TX AT CH 600</u>										
Sample No: <u>S09</u>										
Location: <u>AC 3</u>			RBW: <u>1 MHz</u>						Measurement	
Detector Type: <u>Peak</u>			VBW: <u>1 MHz</u>						Distance: <u>3 m</u>	
Test Equipment Used										
Antenna: <u>993</u>			Directional Coupler: _____							
Pre-Amp: <u>1016</u>			Cable #1: <u>1484</u>							
Filter: <u>1481</u>			Cable #2: <u>1485</u>							
Receiver: <u>1464</u>			Cable #3: <u>1043</u>							
Attenuator #1 <u>1472</u>			Cable #4: _____							
Attenuator #2: _____			Mixer: _____							
Additional equipment used: _____										
Measurement Uncertainty: <u>+/-3.6 dB</u>										
Frequency (MHz)	Meter Reading (dBm)	Correction Factor (dB)	Attn. (dB)	Pre-Amp Gain (dB)	Substitution Antenna Gain (dBd)	Limit (dBm)	ERP (dBm)	ERP (mW)	Polarity	Comments
3760	-55.0	34.3	20	33.7	8.0	-13	-26.4	0.002307	H	Noise floor
5640	-56.0	36.0	20	33.5	9.1	-13	-24.4	0.003597	H	Noise floor
7520	-54.8	39.8	20	33	9.4	-13	-18.6	0.013868	H	Noise floor
9400	-54.8	41.4	20	35.7	10.1	-13	-19.1	0.012417	H	Noise floor
11280	-54.6	44.4	20	35.8	11.1	-13	-14.9	0.032211	H	Noise floor
13160	-62.1	47.5	20	34.5	11.2	-13	-18.0	0.015885	H	Noise floor
15040	-61.8	47.1	20	32.7	11.4	-13	-16.0	0.024889	H	Noise floor
16920	-61.1	46.1	20	32.7	13.0	-13	-14.6	0.034356	H	Noise floor
3760	-55.0	40.4	20	33.7	8.0	-13	-20.3	0.009290	V	Noise floor
5640	-56.0	38.5	20	33.5	9.1	-13	-21.9	0.006397	V	Noise floor
7520	-54.8	40.4	20	33	9.4	-13	-17.9	0.016069	V	Noise floor
9400	-54.8	39.3	20	35.7	10.1	-13	-21.2	0.007621	V	Noise floor
11280	-54.6	42.0	20	35.8	11.1	-13	-17.4	0.018365	V	Noise floor
13160	-62.1	44.8	20	34.5	11.2	-13	-20.6	0.008670	V	Noise floor
15040	-61.8	46.5	20	32.7	11.4	-13	-16.6	0.021777	V	Noise floor
16920	-61.1	44.3	20	32.7	13.0	-13	-36.5	0.000226	V	Noise floor
1880	-15.0	29.9	0	0	6.4		21.2	131.825674	V	Fundamental Reading
1880	-21.3	32.7	0	0	6.4		17.7	59.429216	H	Fundamental Reading
Notes: _____										

Nemko Dallas

FCC PART 24, SUBPART E

BROADBAND PCS SUBSCRIBER STATION

EQUIPMENT: GPC-2100

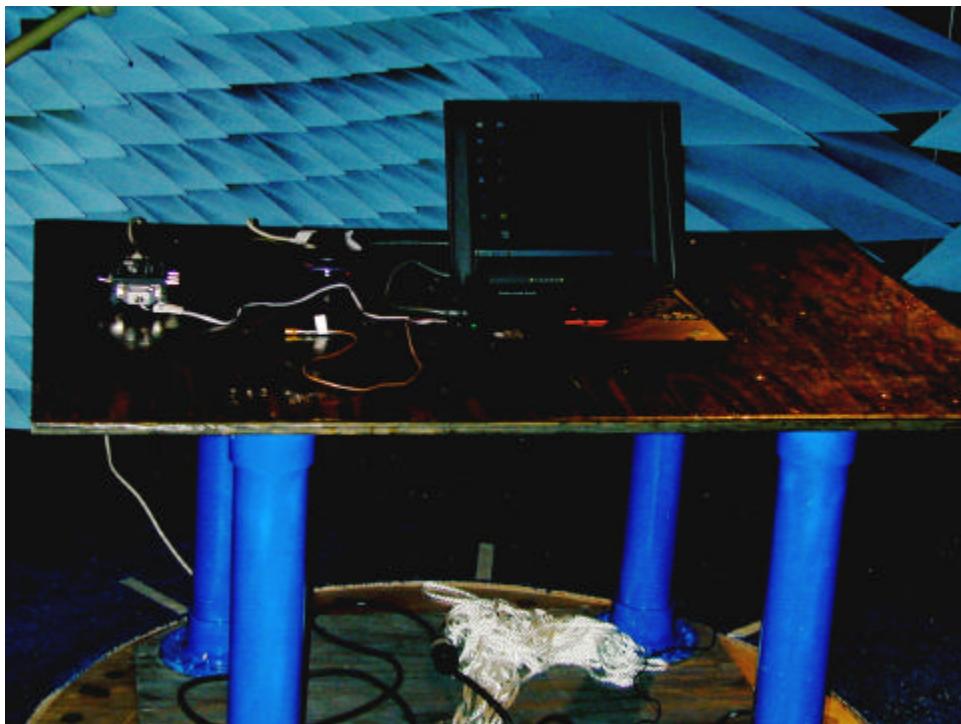
FCC ID: PL5GPC-2100

PROJECT NO.:

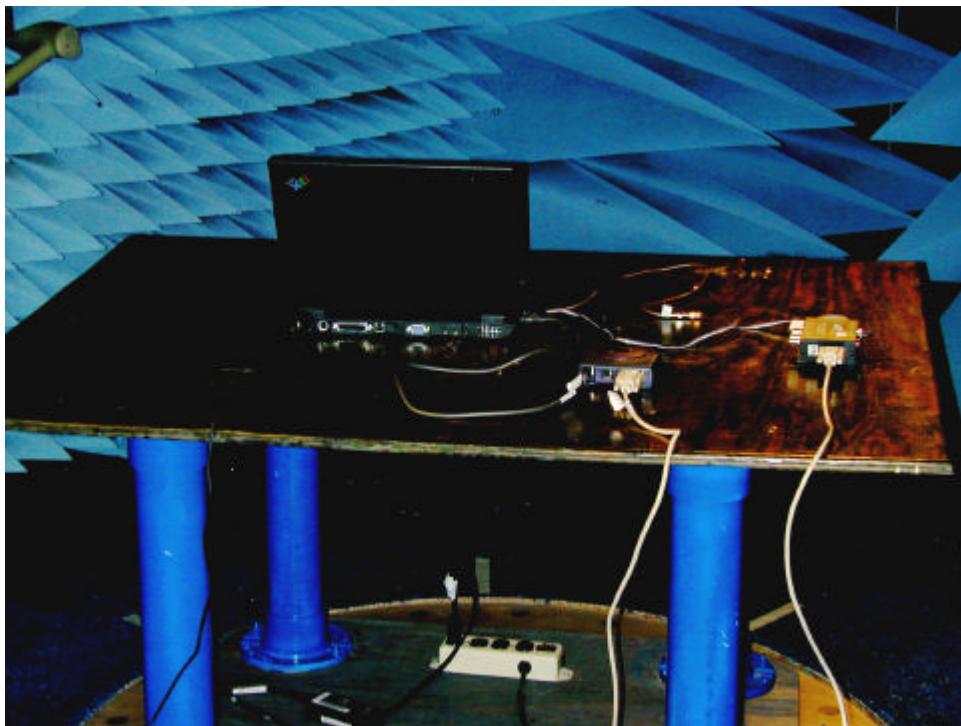
1L0456RUS1

Photographs of Test Setup

FRONT VIEW



REAR VIEW



Nemko Dallas

FCC PART 24, SUBPART E

BROADBAND PCS SUBSCRIBER STATION

EQUIPMENT: GPC-2100

FCC ID: PL5GPC-2100

PROJECT NO.:

1L0456RUS1

Section 7. Frequency Stability

NAME OF TEST: Frequency Stability

PARA. NO.: 24.235

TESTED BY: David Light

DATE: 9/4/01

Test Results: Complies.

Measurement Data: Standard Test Frequency: 1880 MHz
Standard Test Voltage: 3.8 Vdc

Nemko Dallas

FCC PART 24, SUBPART E

BROADBAND PCS SUBSCRIBER STATION

EQUIPMENT: GPC-2100

FCC ID: PL5GPC-2100

PROJECT NO.: 1L0456RUS1

Test Data –Frequency Stability



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

Frequency Stability

Client: Gtran

W.O.# 1L0456R

EUT: PCS PCMCIA modem

S/N: S09

Date: 9/4/01

Tech: Walker

Test Equipment used:

Temperature	Voltage	Frequency Error (Hz)
20 °C	3.8 Vdc	1250
20 °C	4.4 Vdc	1230
20 °C	3.2 Vdc	1230
10 °C	3.8 Vdc	480
0 °C	3.8 Vdc	350
-10 °C	3.8 Vdc	20
-20 °C	3.8 Vdc	360
30 °C	3.8 Vdc	130
40 °C	3.8 Vdc	1570
50 °C	3.8 Vdc	1100
-30 °C	3.8 Vdc	Device ceased operation at -24°C
-24 °C	3.8 Vdc	342

Data taken 12/21-01

Data taken 12/21-01

Nemko Dallas**FCC PART 24, SUBPART E****BROADBAND PCS SUBSCRIBER STATION****EQUIPMENT:** GPC-2100**FCC ID:** PL5GPC-2100**PROJECT NO.:** 1L0456RUS1**Section 8. Test Equipment List**

ASSET	Description	Manufacturer Model Number	Serial Number	Cal. Date
925	Duel tracking DC power supply	Topward 6306D	0	01/00/00
1171	Frequency counter	Hewlett Packard 5340A	1724A04663	09/07/00
1043	Flexible cable 1m	Astrolab Inc. 32027-2-29094K-1M	0	01/29/01
1464	Spectrum analyzer	Hewlett Packard 8563E	3551A04428	01/02/01
1485	Cable 2.0-18.0 Ghz	Storm PR90-010-216	N/A	06/01/01
1484	Cable 2.0-18.0 Ghz	Storm PR90-010-072	N/A	06/01/01
1036	SPECTRUM ANALYZER	ROHDE & SCHWARZ FSEK30	830844/006	09/17/01
1473	20db Attenuator DC 18 Ghz	Midwest Microwave 290-20db	NONE	CBU
1483	Cable 4m	Storm PR90-010-144	N/A	06/04/01
1481	Microwave Highpass Filter	K & L 3DH1-2000/T8000-0/0	4	Cal B4 Use
1472	20db Attenuator DC 18 Ghz	Omni Spectra 20600-20db	NONE	CBU
993	Horn antenna	A.H. Systems SAS-200/571	XXX	07/16/99
283	ENVIRONMENTAL CHAMBER	ENVIROTRONICS SH27	129010083	05/02/01

Nemko Dallas

FCC PART 24, SUBPART E

BROADBAND PCS SUBSCRIBER STATION

EQUIPMENT: GPC-2100

FCC ID: PL5GPC-2100

PROJECT NO.:

1L0456RUS1

ANNEX A - TEST METHODOLOGIES

Nemko Dallas

FCC PART 24, SUBPART E

BROADBAND PCS SUBSCRIBER STATION

EQUIPMENT: GPC-2100

FCC ID: PL5GPC-2100

PROJECT NO.:

1L0456RUS1

NAME OF TEST: RF Power Output

PARA. NO.: 2.985

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: CDMA Per ANSI/J-STD-008
TDMA Per ANSI/J-STD-010
PCS 1900 Per ANSI/J-STD-007

Detachable Antenna:

The peak power at antenna terminals is measured using an in-line peak power meter or a spectrum analyzer.

Integral Antenna:

If the antenna is not detachable from the circuit then the Peak Power Output is derived from the peak radiated field strength of the fundamental emission by using the plane wave relation $GP/4\pi R^2 = E^2/120\pi$ and proceeding as follows:

$$P = \frac{E^2 R^2}{30G} = \frac{E^2 3^2}{30G}$$

where,

P = the equivalent isotropic radiated power in watts

E = the maximum measured field strength in V/m

R = the measurement range (3 meters)

G = the numeric gain of the transmit antenna in relation to an isotropic radiator

Nemko Dallas

FCC PART 24, SUBPART E

BROADBAND PCS SUBSCRIBER STATION

EQUIPMENT: GPC-2100

FCC ID: PL5GPC-2100

PROJECT NO.:

1L0456RUS1

NAME OF TEST: Occupied Bandwidth

PARA. NO.: 2.989

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 Per ANSI/J-STD-008

Spectrum analyzer settings:

RBW: 30 kHz

VBW: \geq RBW

Span: 5 MHz

Sweep: Auto

GSM Per ANSI/J-STD-007

RBW: 3 kHz

VBW: \geq RBW

Span: 2 MHz

Sweep: Auto

NADC Per IS-136

RBW: 1 kHz

VBW: \geq RBW

Span: 1 MHz

Sweep: Auto

Nemko Dallas

FCC PART 24, SUBPART E

BROADBAND PCS SUBSCRIBER STATION

EQUIPMENT: GPC-2100

FCC ID: PL5GPC-2100

PROJECT NO.:

1L0456RUS1

NAME OF TEST: Spurious Emission at Antenna Terminals PARA. NO.: 2.991

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 Per ANSI/J-STD-008

RBW: 1 MHz (> 1 MHz from Band Edge)
RBW: 20 kHz (< 1MHz from Band Edge)
VBW: \geq RBW
Sweep: Auto
Video Avg: 6 Sweeps

GSM Per ANSI/J-STD-007

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

NADC Per IS-136

RBW: 1 MHz (> 1 MHz from Band Edge)
RBW: 1 kHz (< 1 MHz from Band Edge)
VBW: \geq 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.

Nemko Dallas

FCC PART 24, SUBPART E

BROADBAND PCS SUBSCRIBER STATION

EQUIPMENT: GPC-2100

FCC ID: PL5GPC-2100

PROJECT NO.:

1L0456RUS1

NAME OF TEST: Field Strength of Spurious Radiation	PARA. NO.: 2.993
---	-------------------------

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: TIA/EIA-603-1992, Section 2.2.12

The antenna substitution method was used to determine the equivalent radiated power at spurious frequencies. The spurious emissions were measured at a distance of 3 meters. The EUT was then replaced with a reference substitution antenna with a known gain referenced to a dipole. This antenna was fed with a signal at the spurious frequency. The level of the signal was adjusted to repeat the previously measured level. The resulting erp is the signal level fed to the reference antenna corrected for gain referenced to a dipole.

Nemko Dallas

FCC PART 24, SUBPART E

BROADBAND PCS SUBSCRIBER STATION

EQUIPMENT: GPC-2100

FCC ID: PL5GPC-2100

PROJECT NO.:

1L0456RUS1

NAME OF TEST: Frequency Stability

PARA. NO.: 2.995

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: CDMA Per ANSI/J-STD-008
TDMA Per ANSI/J-STD-007
NADC Per IS-136

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. 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.

Digitally Modulated Signals

Equipment that produces a digitally modulated carrier is tested using a vector modulation analyzer. Frequency accuracy and rho are measured over the specified environmental extremes.

Nemko Dallas

FCC PART 24, SUBPART E

BROADBAND PCS SUBSCRIBER STATION

EQUIPMENT: GPC-2100

PL5GPC-2100

PROJECT NO.:

1L0456RUS1

ANNEX B - TEST DIAGRAMS

Nemko Dallas

FCC PART 24, SUBPART E

BROADBAND PCS SUBSCRIBER STATION

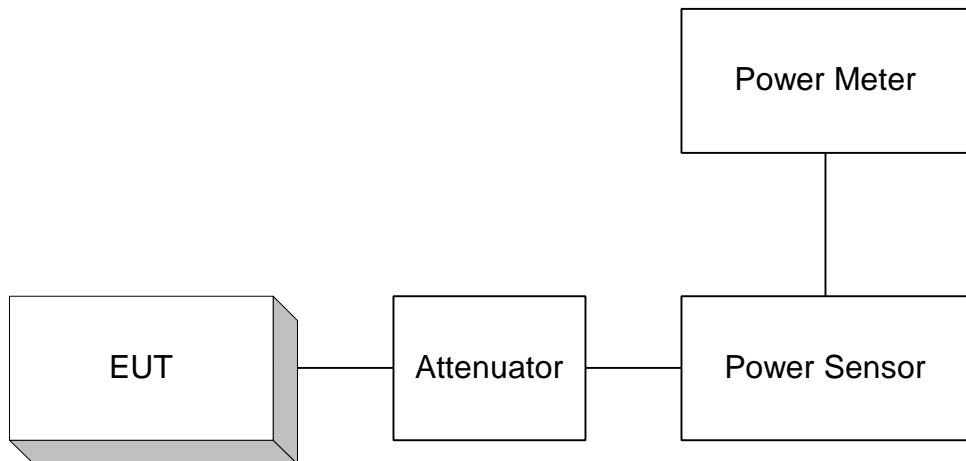
EQUIPMENT: GPC-2100

FCC ID: PL5GPC-2100

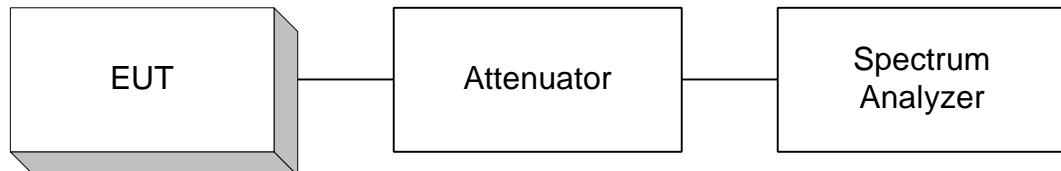
PROJECT NO.:

1L0456RUS1

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



Para. No. 2.989 - Occupied Bandwidth



Nemko Dallas

FCC PART 24, SUBPART E

BROADBAND PCS SUBSCRIBER STATION

EQUIPMENT: GPC-2100

FCC ID: PL5GPC-2100

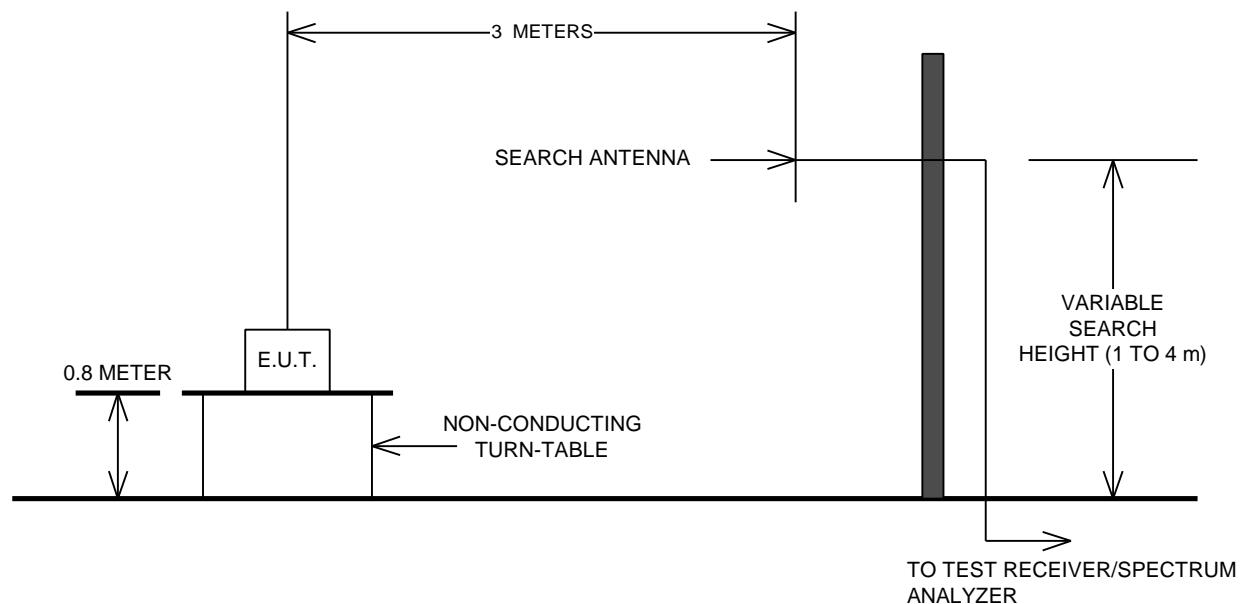
PROJECT NO.:

1L0456RUS1

Para. No. 2.991 Spurious Emissions at Antenna Terminals



Para. No. 2.993 - Field Strength of Spurious Radiation



Nemko Dallas

FCC PART 24, SUBPART E

BROADBAND PCS SUBSCRIBER STATION

EQUIPMENT: GPC-2100

FCC ID: PL5GPC-2100

PROJECT NO.:

1L0456RUS1

Para. No. 2.995 - Frequency Stability

