Applicant:	Enfora 661 East 18 <sup>th</sup> Street Plano, TX 75074-5601
Equipment Under Test:	Alpine GPRS 919
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:	10/25/01
Total Number of Pages:	35

Nemko Test Report: 1L0486RUS1

EQUIPMENT:

## **Alpine GPRS 919**

## PROJECT NO.: 1L0486RUS1

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EQUIPMENT	·:	Alpine GPRS 919	PROJECT NO.: 1L0486RUS1							
Section 1.		Summary of Test Res	sults							
Manufacturer:	:	Enfora								
Model No.:		Alpine GPRS 919								
Serial No.:		1								
General:		All measurements are trace	ll measurements are traceable to national standards.							
		lucted on a sample of the equi Part 24, Subpart E.	pment for the p	urpose	of demonstrating					
	New S	ubmission		Produ	ction Unit					
	Class I	I Permissive Change		Pre-Pr	oduction Unit					
	THIS	TEST REPORT RELATES ON	LY TO THE ITI	EM(S) T	ESTED.					
THE FOLLO	WING D	DEVIATIONS FROM, ADDITIONS FROM SPECIFICATIONS HAT See "Summary of	VE BEEN MAD		ONS FROM THE TEST					
		NVL	<u>7</u> 0							
		NVLAP LAB COI	DE: 100426-0							

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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.

## **Summary Of Test Data**

NAME OF TEST	PARA.	SPEC.	RESULT	
	NO.			
RF Power Output	24.232	100W	Complies	
Occupied Bandwidth (GPRS)	24.238	Not Specified	Included for information	
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	

## Section 2. General Equipment Specification

Supply Voltage Input:	3.3 - 5 Vdc
Frequency Bands:	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:	GPRS 200K0G7W
Output Impedance:	50 ohms
RF Output (Rated):	1 Watt

#### **System Description**

The GSM communication system, in general, is standardized to operate in multiple bands, primarily, the 900 MHz band which is assigned PGSM, EGSM, RGSM for short, 1800 MHz band which is assigned DCS and the 1900 MHz band which is assigned PCS. Both the GSM and DCS band are used globally for mobile voice communication. The PCS 1900 is used in North, Central and South America. The GSM 900 band is disabled for these markets.

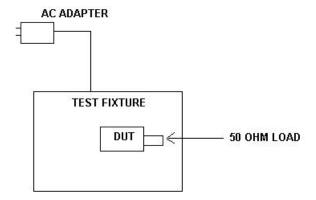
Although the GSM digital voice standard has existed for well over a decade, it wasn't until recently that the demand for wireless data capability has increased. GPRS is a protocol within the GSM standard, which was developed to address the need for data only transmission. Although the GSM voice protocol does support data transmission, it is limited in data rate due to overhead within the voice protocol. What the GRPS allows is a faster data rate that is adaptive as well as being packet based.

The Enabler transceiver design is based on a proprietary chip set that complements size, cost and power consumption. Enabler-G919 is a dual band EGSM 900 MHz and PCS 1900 MHz design in a 1.7" x 2.7" x 0.2" housing. It communicates via an RF antenna port and a multiple pin digital connector. The RF and digital processors are design to operate at 3.8V. The band is selected at the front end via a high power RF Switch. This signal is then prefiltered to remove large out-of-band signals from compressing the LNA. It is then filtered again to prevent the down converter from converting unwanted signal into the IF band. An IF filter is used to set the channel BW to about 200 KHz. This high selectivity IF filter will allow the Enabler to operate through a high dynamic range. The AGC amplifier in conjunction with the DSP chip will automatically adjust the gain to maintain a constant baseband signal. The I&Q demodulator converts the RF signal into 2 baseband signals called Rx I & Q. This prefiltered I&Q signal is sent to the DSP processor where it is digitized for signal processing.

On the transmit section, the post filtered I &Q baseband signal is connected to the I&Q modulator. Using an open loop PLL, the dual band transmit VCO is modulated directly using the charge pump from the modulator section. The advantage of such methodology is an improved carrier and sideband suppression. The modulated RF signal is injected into the power amplifier where it is amplified to its respective level. An RF power detector circuit is used to control the RF level at the antenna port.

The primary function of the Enabler SDK is to allow the module to communicate with external peripherals. It provides pre-voltage regulation, serial interface and mechanical support for the Enabler module. It also allows probing and monitoring of digital signal traffic in and out of the Enabler module.

#### **System Diagram**



# FCC PART 24, SUBPART E BROADBAND PCS SUBSCRIBER STATION

EQUIPMENT: Alpine GPRS 919 PROJECT NO.: 1L0486RUS1

## Section 3. RF Power Output

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

TESTED BY: David LightTom Tidwell & Debbie Jensen DATE:10/12/2001

**Test Results:** Complies.

**Measurement Data:** 

Modulation Type	Channel	Output Power	Output Power		
		(dBm)	(W)		
GPRS	662	29.6	0.912		
GPRS	512	29.4	0.871		
GPRS	810	29.3	0.851		

# FCC PART 24, SUBPART E BROADBAND PCS SUBSCRIBER STATION

EQUIPMENT: Alpine GPRS 919 PROJECT NO.: 1L0486RUS1

Section 4. Occupied Bandwidth

NAME OF TEST: Occupied Bandwidth (GPRS)

PARA. NO.: 2.1047

TESTED BY: David LightTom Tidwell & Debbie Jensen DATE:10/12/2001

**Test Results:** Complies.

**Test Data:** See attached plots.

PROJECT NO.: 1L0486RUS1 **EQUIPMENT**: **Alpine GPRS 919** 

## Test Data - Occupied Bandwidth



#### Dallas Headquarters:

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

Data Plot				Oc	cupied Ba	andwidth					
Page 1 of	<u>3</u>							Comple	te X	_	
Job No.:	1L048	36R		Date: 10	0/12/2001			Prelimina	ry	_	
Specification:	PART 2	24	Tem	perature(°C): 22	2					_	
Tested By:	David I	ight	Relative	Humidity(%) 45	5						
E.U.T.:	ALPIN	E GPRS 919	-		_						
Configuration:	TRANS	MIT - OPER	ATING IN TEST	Γ FIXTURE							
Sample Number:	1										
Location:	Lab	1			RBW:	Refer to plots					
Detector Type:	Pea	k			VBW:	Refer to plots					
m .m					•						
Test Equipme Antenna:	ent Use	<u>a</u>		Direct	ional Coupler:						
Pre-Amp:	-			Direct	Cable #1:	1627					
Filter:					Cable #1:	1027					
Receiver:	103				Cable #2:						
Attenuator #1	147				Cable #4:						
Attenuator #1 Attenuator #2:	147										
					Mixer:						
Additional equips			ID								
Measurement Un	certainty	+/-3.6	dB								
<b>1</b>						KRM		HZ RF	- Att	30 GB	
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-50											
-60											
Cent	er 1	.88021	979 GHz		200	kHz/			Spa	n 2 MHz	
Date:	1:	2.OCT.2	2001 12	:52:36							
Notes:	CHAN	NEL 662									
									-	-	

## **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 <u>2</u> of <u>3</u> 1L0486R Job No.: Date: 10/12/2001 PART 24 Temperature(°C): 22 Specification: Tested By: David Light Relative Humidity(%) 45 E.U.T.: ALPINE GPRS 919 Configuration: TRANSMIT - OPERATING IN TEST FIXTURE Ref Lvl 20 kHz VBW 40 dBm SWT 10 s Unit dBm 30.5 dB Offset 30 20 10 1 V I E W 1MA -20 -30 -40 -50 Center 1.85022 GHz 200 kHz/ Span 2 MHz ate: 12.0CT.2001 12:53:57 Channel 512

## Test Data - Occupied Bandwidth



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

Nemko Dallas, Inc. Occupied Bandwidth **Data Plot** Page 3 of 3 1L0486R Date: 10/12/2001 Job No.: Specification: PART 24 Temperature(°C):  $\underline{22}$ Tested By: David Light Relative Humidity(%) 45 E.U.T.: ALPINE GPRS 919 Configuration: TRANSMIT - OPERATING IN TEST FIXTURE Ref Lvl VBW 20 kHz 40 dBm SWT 10 s Un i t dBm 30.5 dB Offset 30 20 1 V I E W 1 MA - 10 -20 -30 Hambury Market -40 -50 -60 200 kHz/ Center 1.9098 GHz Span 2 MHz 12.OCT.2001 12:55:45 ate: Channel 810

## Section 5. Spurious Emissions at Antenna Terminals

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

TESTED BY: David LightTom Tidwell & Debbie Jensen DATE:10/12/2001

**Test Results:** Complies.

**Test Data:** See attached plots

## Test Data – Spurious Emissions at Antenna Terminals



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

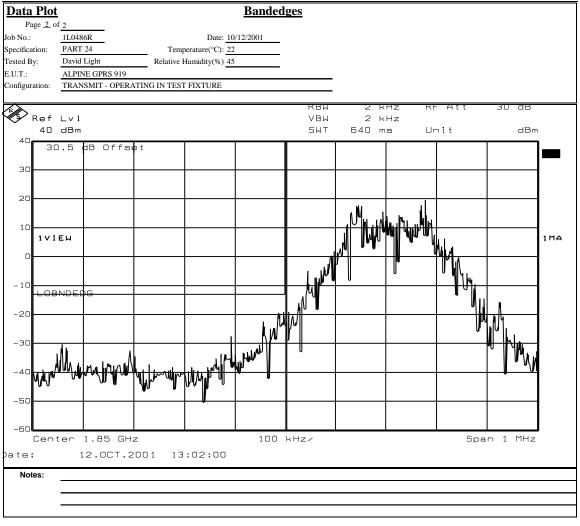
Data Plot				Bande	edges					
Page 1 of	f <u>2</u>						Comple	te X	_	
ob No.:	1L0486R		Date: 10/	12/2001			Prelimina	ry	_	
specification:	PART 24	Ter	nperature(°C): 22		_					
ested By:	David Light	Relative	e Humidity(%) 45		_					
E.U.T.:	ALPINE GPR	S 919								
Configuration:		OPERATING IN TE	ST FIXTURE							
ample Number:	1		_							
ocation:	Lab 1				Refer to plots					
Detector Type:	Peak			VBW:	Refer to plots					
<u>Γest Equipm</u>	ent Used									
Antenna:			Direction	onal Coupler:						
re-Amp:				Cable #1:	1627					
ilter:				Cable #2:						
Receiver:	1036			Cable #3:						
Attenuator #1	1470			Cable #4:						
Attenuator #2:	1478			Mixer:						
Additional equipi	ment used:									
Measurement Un	certainty:	+/-3.6 dB								
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ate:			3:00:03							
Notes:	Channel 810	)								

## **Test Data – Spurious Emissions at Antenna Terminals**



#### Dallas Headquarters:

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



## **Test Data – Spurious Emissions at Antenna Terminals**



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

Fax: (972) 436-2667

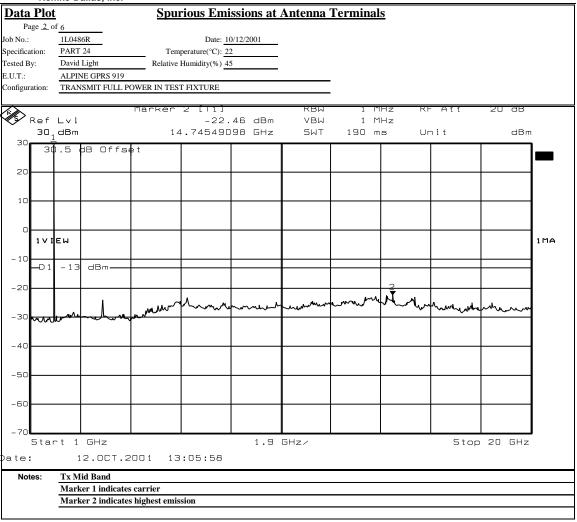
Data	Plot				Spu	rious E	missic	ns at	Antenna	Termina	<u>lls</u>				
Pa	ge <u>1</u> of	<u>6</u>										Complete	X		
Job No.:		1L04	486R			Date	e: 10/12/2	001			Pr	eliminary			
Specificat	tion:	PART	24			perature(°C									
Tested By	y:	David			Relative	Humidity(%	(a) <u>45</u>								
E.U.T.:			NE GPRS 919							_					
Configura	ation:	TRAN	ISMIT FULL	POWER	IN TES	T FIXTURE	3			_					
Sample N	lumber:		1			-									
Location:		La							Refer to plots	_					
Detector	Type:	Pe	ak					VBW:	Refer to plots	-					
Test Eq	juipme	nt Us	<u>ed</u>												
Antenna:						Di	irectional	Coupler:		_					
Pre-Amp:	:						C	Cable #1:	1627	_					
Filter:							(	Cable #2:		_					
Receiver:	:	10	36				C	Cable #3:		_					
Attenuato	or #1		70				(	Cable #4:		_					
Attenuato	or #2:	14	78					Mixer:		_					
Additiona										_					
Measurer	nent Und	ertaint	y: +/-3	.6 dB											
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-50											1				
-60				1								- 1			
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Note	es:	Tx M	id Band			-									

## **Test Data – Spurious Emissions at Antenna Terminals**



#### Dallas Headquarters:

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



## **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. **Spurious Emissions at Antenna Terminals Data Plot** Page <u>3</u> of 6 1L0486R Date: 10/12/2001 Job No.: Specification: PART 24 Temperature(°C):  $\underline{22}$ Tested By: David Light Relative Humidity(%) 45 E.U.T.: ALPINE GPRS 919 TRANSMIT FULL POWER IN TEST FIXTURE Configuration: 3U aB Ref Lvl -27.82 dBm VBW 100 kHz 780.34068136 MHz 40 dBm 5WT 245 ms Unit dBm 30.5 dB Offset 30 20 10 1 V I E W 1MA -20 -30 -40 -50 -En Start 30 MHz 97 MHz/ Stop 1 GHz 12.0CT.2001 13:10:11 Notes: Tx Lowest channel

## **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. **Spurious Emissions at Antenna Terminals Test Plot:** Page <u>4</u> of 6 1L0486R Date: 10/12/2001 Job No.: Specification: PART 24 Temperature(°C):  $\underline{22}$ Tested By: David Light Relative Humidity(%) 45 E.U.T.: ALPINE GPRS 919 TRANSMIT FULL POWER IN TEST FIXTURE Configuration: кви Ref Lvl -22.66 dBm 1 MHz VBW 13.86973948 GHz  $30_1 dBm$ SWT 190 ms Unit dBm 30 3þ.5 dB Offset 20 10 1 MA dBm--20 -30 -40 -50 -60 Center 10.5 GHz 1.9 GHz/ Span 19 GHz 12.0CT.2001 13:09:17 Notes: Tx Lowest channel Marker 1 indicates carrier Marker 2 indicates highest emission

## **Test Data – Spurious Emissions at Antenna Terminals**



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

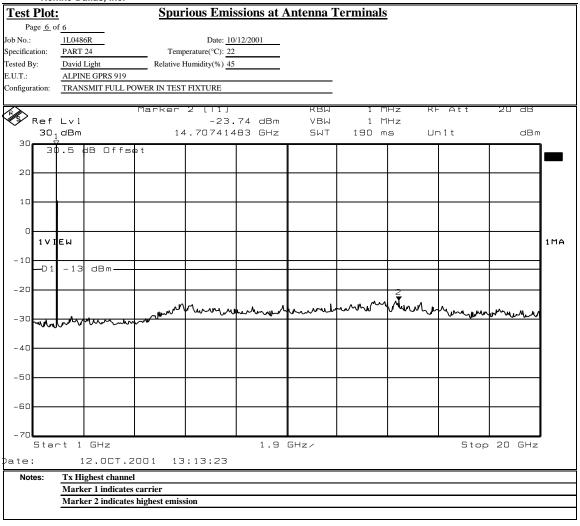
Nemko Dallas, Inc. **Spurious Emissions at Antenna Terminals Test Plot:** Page <u>5</u> of 6 1L0486R Date: 10/12/2001 Job No.: Specification: PART 24 Temperature(°C):  $\underline{22}$ Tested By: David Light Relative Humidity(%) 45 E.U.T.: ALPINE GPRS 919 TRANSMIT FULL POWER IN TEST FIXTURE Configuration: RBM Ref Lvl -27.21 dBm VBW 100 kHz 40 dBm 965.01002004 MHz SWT 245 ms Un i t dBm 30.5 dB Offset 30 20 10 1 V I E W 1 MA -10 **-**D1 −13 dBm--20 -30 more and the second gradual and gradua -40 -50 -60 Center 515 MHz 97 MHz/ Span 970 MHz ate: 12.0CT.2001 13:12:30 Tx Highest channel

PROJECT NO.: 1L0486RUS1 **EQUIPMENT**: **Alpine GPRS 919** 

## **Test Data – Spurious Emissions at Antenna Terminals**



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



# FCC PART 24, SUBPART E BROADBAND PCS SUBSCRIBER STATION

EQUIPMENT: Alpine GPRS 919 PROJECT NO.: 1L0486RUS1

Section 6. Field Strength of Spurious

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

TESTED BY: David LightTom Tidwell & Debbie Jensen DATE:10/12/2001

**Test Results:** Complies.

**Test Data:** See attached table.

PROJECT NO.: 1L0486RUS1 **Alpine GPRS 919 EQUIPMENT:** 

#### **Test Data - Radiated Emissions**



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

			Field S	Strength of S	purious 1	Emissions	1		
Page <u>1</u> o	f <u>1</u>		'				Complete		
Job No.:	1L0486R		Date	10/12/2001			Preliminary	X	=' 
Specification:	Part 24		Temperature(°C)	22					-
Tested By:	Tom Tidwel	1	Relative Humidity(%)	45					
E.U.T.:	ALPINE GF	PRS 919				_			
Configuration:	transmit full	power in test fixt	ture			_			
Sample No:	1								
Location:	AC 3			RBW:	1 MHz	_	Measurement		
Detector Type:	Peak			VBW:	=	Distance:	3	m	
Test Equipm	ent Used								
Antenna:			I	Directional Coupler:		_			
Pre-Amp:				Cable #1:	1484				
Filter:	1481			Cable #2:	1485	_			
Receiver:	1464			Cable #3:		_			
Attenuator #1				Cable #4:		_			
Attenuator #2:				Mixer:		_			
Additional equip	ment used:					_			
Measurement Un	certainty:	+/-3.6 dB							
Frequency	Meter	Correction	Pre-Amp	Substitution		ERP	ERP	Polarity	Comments
	Reading	Factor	Gain	Antenna Gain					
(MHz)	(dBm)	(dB)	(dB)	(dBd)		(dBm)	(mW)		
2760	40.0	24.2	22.7	8.0		21.4	0.000720	ш	S/N 1

Frequency	Meter Reading	Correction Factor		e-Amp Gain	Substitution Antenna Gain	ERP	ERP	Polarity	Comments
(MHz)	(dBm)	(dB)	(	(dB)	(dBd)	(dBm)	(mW)		
3760	-40.0	34.3	3	33.7	8.0	-31.4	0.000729	H	S/N 1
5640	-56.3	36.0	3	33.5	9.1	-44.7	0.000034	Н	
7521	-55.7	39.8		33	9.4	-39.5	0.000113	Н	
9400	-56.8	41.4	3	35.7	10.1	-41.1	0.000078	Н	
11280	-65.0	44.4	3	35.8	11.1	-45.3	0.000029	Н	
3760	-31.5	40.4		33.7	8.0	-16.8	0.020797	V	
5640	-50.5	38.5	3	33.5	9.1	-36.4	0.000227	V	
7521	-49.3	40.4		33	9.4	-32.4	0.000570	V	
9400	-49.5	39.3	3	35.7	10.1	-35.9	0.000258	V	
11280	-56.5	42.0	3	35.8	11.1	-39.3	0.000119	V	

Notes: Scanned to the 10th Harmonic of carrier

## **Photographs of Test Setup**

FRONT VIEW



REAR VIEW



## Section 7. Frequency Stability

NAME OF TEST: Frequency Stability PARA. NO.: 24.235

TESTED BY: Tom Tidwell & Debbie Jensen DATE:

**Test Results:** Complies.

Measurement Data: Standard Test Frequency: 1880.131 MHz

Standard Test Voltage: 115 VAC

#### **Frequency Stability**

Client: ENFORA W.O.# 1L0486R

EUT: <u>ALPINE GPRS 919</u> S/N: <u>1</u>

Date: 10/15/2001 Tech: LIGHT

Test Equipment used: 1026-283

Temperature	Voltage	Frequency Error (Hz)	
20 °C	115 VAC	0	
20 °C	98 VAC	+10	
20 °C	132 VAC	+12	
10 °C	115 VAC	+233	
0 °C	115 VAC	+544	
-10 °C	115 VAC	+642	
-20 °C	115 VAC	+426	
-30 °C	115 VAC	N/A	
30 °C	115 VAC	+33	
40 °C	115 VAC	+486	
50 °C	115 VAC	-560	

## Section 8. Test Equipment List

ASSET	Description	Manufacturer Model Number	Serial Number	Cal. Date	Cal. Due		
1029	PEAK POWER METER	HP 8900D	3303U0012	03/12/01	03/12/02		
1030	PEAK POWER SENSOR	HP 84811A	2539A03573	03/12/01	03/12/02		
1036	SPECTRUM ANALYZER	ROHDE & SCHWARZ FSEK30	830844/006	09/17/01	09/18/03		
1470	10 db Attenuator DC 18 Ghz	MCL Inc. BW-S10W2 10db-2WDC	NONE	CBU	N/A		
1478	20db Attenuator DC 18 Ghz	MCL Inc. BW-S20W6	NONE	CBU	N/A		
1627	CABLE, 5 ft	MEGAPHASE 10312 1GVT4	N/A	CBU	N/A		
1481	Microwave Highpass Filter	K & L 3DH1-2000/T8000-0/0	4	Cal B4 Use	N/A		
1464	Spectrum analyzer	Hewlett Packard 8563E	3551A04428	01/02/01	01/02/02		
1484	Cable 2.0-18.0 Ghz	Storm PR90-010-072	N/A	06/01/01	06/01/02		
1485	Cable 2.0-18.0 Ghz	Storm PR90-010-216	N/A	06/01/01	06/01/02		
993	Horn antenna	A.H. Systems SAS-200/571	XXX	07/16/99	10/15/01		
1026	FREQUENCY COUNTER	HEWLETT PACKARD 5350B	8232A01493	08/14/01	08/14/02		
283	ENVIROMENTAL CHAMBER	ENVIROTRONICS SH27	129010083	05/02/01	05/02/02		

**Annex A - Test Methodologies** 

PARA. NO.: 2.985

EQUIPMENT: Alpine GPRS 919 PROJECT NO.: 1L0486RUS1

NAME OF TEST: RF Power Output

**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

# FCC PART 24, SUBPART E BROADBAND PCS SUBSCRIBER STATION

EQUIPMENT: Alpine GPRS 919 PROJECT NO.: 1L0486RUS1

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: ≥ RBW Span: 5 MHz Sweep: Auto

#### GSM Per ANSI/J-STD-007

RBW: 3 kHz VBW: ≥ RBW Span: 2 MHz Sweep: Auto

#### NADC Per IS-136

RBW: 1 kHz VBW: ≥ RBW Span: 1 MHz Sweep: Auto

# FCC PART 24, SUBPART E BROADBAND PCS SUBSCRIBER STATION

EQUIPMENT: Alpine GPRS 919 PROJECT NO.: 1L0486RUS1

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 GSM Per ANSI/J-STD-007

RBW: 1 MHz (> 1 MHz from Band Edge)
RBW: 1 MHz (> 1 MHz from Band Edge)
RBW: 3 kHz (< 1 MHz from Band Edge)
RBW: 3 kHz (< 1 MHz from Band Edge)

 $VBW: \ge RBW$   $VBW: \ge RBW$  Sweep: Auto

Video Avg: 6 Sweeps Video Avg: Disabled

#### NADC Per IS-136

RBW: 1 MHz (> 1 MHz from Band Edge) RBW: 1 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.

# FCC PART 24, SUBPART E BROADBAND PCS SUBSCRIBER STATION

EQUIPMENT: Alpine GPRS 919 PROJECT NO.: 1L0486RUS1

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.

## FCC PART 24, SUBPART E BROADBAND PCS SUBSCRIBER STATION

EQUIPMENT: Alpine GPRS 919 PROJECT NO.: 1L0486RUS1

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

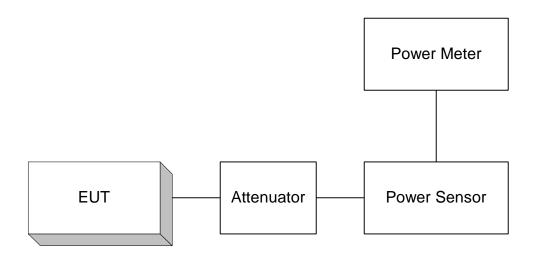
The input voltage to the E.U.T. is set to S.T.V. and the temperature of the environmental chamber is varied in 10 degree steps from -30 degrees C to +50 degrees C. The E.U.T. is allowed to stabilize at each temperature and the frequency is measured in 30 second intervals for a period of 5 minutes.

#### **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.

Annex B - Test Diagrams

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



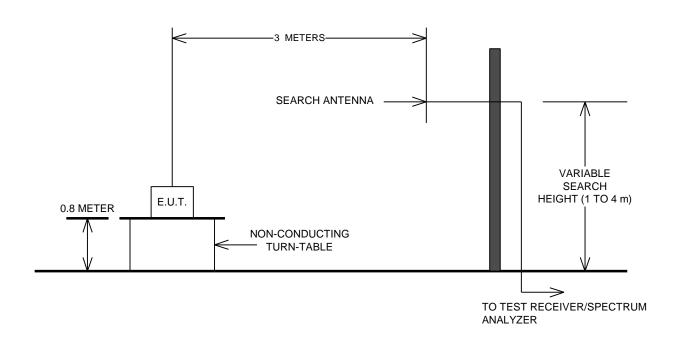
Para. No. 2.989 - Occupied Bandwidth



Para. No. 2.991 Spurious Emissions at Antenna Terminals



Para. No. 2.993 - Field Strength of Spurious Radiation



Para. No. 2.995 - Frequency Stability

