Nemko Test Report:	4L0194RUS4REV1
Applicant:	Enfora, Inc. 661 E. 18 th Street Plano, TX 75074
Equipment Under Test: (E.U.T.)	GSM0110
In Accordonae With	ECC Bort 24 Subport E
in Accordance with:	Broadband PCS Subscriber Station
Tested By:	Nemko USA Inc. 802 N. Kealy Lewisville, TX 75057-3136

Dustin Oaks, Engineer

Date:

4/08/2005

Nemko USA

EQUIPMENT: GSM0110

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Nemko USA

Section 1.		Summary of Test Results					
Manufacturer	:	Enfora, Inc.					
Model No.:		GSM0110					
Serial No.:		None					
General:		All measurements are traceable	e to na	tional standards.			
These tests w demonstrating	vere co g comp	onducted on a sample of the equip bliance with FCC Part 24, Subpart	ment f	or the purpose of			
\boxtimes	New S	ubmission		Production Unit			
	Class	II Permissive Change	\square	Pre-Production Unit			
F	THIS T	EST REPORT RELATES ONLY TO		EM(S) TESTED.			
THE FOLLC	DWING	DEVIATIONS FROM, ADDITIONS T TEST SPECIFICATIONS HAVE BEE See " Summary of Test D	⁻O, OR N MAD ata".	EXCLUSIONS FROM THE E. NONE			
Nemko USA Inc	c. author	rizes the above named company to repro	duce this	s 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 USA 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. NO.	RESULT
RF Power Output	24.232	Complies
Occupied Bandwidth (GSM)	24.238	Complies
Spurious Emissions at Antenna Terminals	24.238(a)	*Complies
Field Strength of Spurious Emissions	24.238(a)	*Complies
Frequency Stability	24.235	Complies

Footnotes:

The conducted data presented in this test report was originally taken in April 2004. Radiated measurements were repeated as the only change was antenna redeisign.

Section 2. General Equipment Specification

Supply Voltage Input:	3.6 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:	300KG7W
Necessary Bandwidth:	300 kHz
Output Impedance:	50 ohms
RF Output (Rated):	2 W (e.i.r.p.)

System Description

This device is a wireless PCMCIA GSM/GPRS wireless modem that operates in the PCS band and in the 800 MHz Cellular band.

System Diagram



Section 3. RF Power Output

NAME OF TEST:	RF Power Output
---------------	------------------------

PARA. NO.: 2.1046

TESTED BY: David Light

DATE: 3/11/05

Test Results: Complies.

Measurement Data:

Antenna Conducted:

Modulation	Power Level	Output Power	Output Power
Type		(dBm)	(W)
GSM	PL0	28	0.63

Unit has no provisions for conducted measurements, values based on manufacturers settings. PL0 is the setting to produce the maximum output power.

Test Data – EIRP (Radiated)

EQUIPMENT: GSM0110

Nem) R	, Inc.	nk	•	EIRP Substi	tution Me	ethod	Dalla Lew Tel: Fax	is Headquar 802 N. Kealy isville, TX 75 (972) 436-9 : (972) 436-2	r ters: / 5057 6600 6667
Page <u>1</u> o	f <u>2</u>			_				Complete	Х	
Job No.:	4L0194			Date:	3/11/05			Preliminary		
Specification:	PT 24		Tem	perature(°C):	24					
Tested By:	David Light		Relative	Humidity(%)	35					
E.U.T.:	Orion									
Configuration:	Tx full powe	er at 1880.2 MHz								
Sample No:	1									
Location:	AC 3				RBW:	300 kHz		Measurement		
Detector Type:	Peak				VBW:	300 kHz		Distance:	3	m
Test Equipm	ent Used									
Antenna:	1304			D	irectional Coupler:					
Pre-Amp:	1016				Cable #1:	1484				
Filter:	1482				Cable #2:	1485				
Receiver:	1464				Cable #3:					
Attenuator #1					Cable #4:					
Attenuator #2:					Mixer:					
Additional equin	ment used:									
Measurement Ur	certainty:	+/-1.7 dB								
Frequency (MHz)	Meter Reading (dBm)	Correction Factor (dB)		Pre-Amp Gain (dB)	Substitution Antenna Gain (dBi)		EIRP (dBm)	EIRP (mW)	Polarity	Comments
1880.2	-11.7	31.0		0	94		28.7	741.3	v	
1880.2	-11.8	33.0		0	9.4		30.6	1148.2	, Н	
1000.2	11.0	55.0			2.4		50.0	1170.2		
1909 8	-12.3	31.0		0	9.4		28.1	645.7	V	
1909.8	-13.0	33.0		0	9.4		29.4	871.0	, H	
1303.0	-15.0	55.0		0	2.7		27. 4	0/1.0	11	
1880.2	-14.0	31.0		0	Q /		26.4	436.5	V	
1880.2	11.0	33.0		0	9.4		20.4	1380 /	<u>v</u> н	
1000.2	-11.0	33.0		0	2.4		51.4	1300.4	11	
Notes	·		J					·		

Section 4. Occupied Bandwidth

NAME OF TEST: Occupied Bandwidth (GSM)	PARA. NO.: 2.1047
TESTED BY: David Light	DATE: 4/14/04

Test Results:

Complies.

Test Data:

See attached plots.



Section 5. Spurious Emissions at Antenna Terminals

NAME OF TEST: Spurious Emissions @ Antenna Terminals	PARA. NO.: 2.1051
TESTED BY: David Light	DATE: 4/14/04

Test Results:

Complies.

Test Data:

NAME OF TEST	WORST-CASE SPURIOUS LEVEL(dBm)
0 to 20 GHz Spurious	-23
Lower Band Edge	-18
Upper Band Edge	-18

Test Data – Spurious Emissions at Antenna Terminals

Data Plot		<u>Spu</u>	rious Emi	ssions at A	Antenna T	Terminals	<u>i</u>			
Page 1 of	f <u>4</u>						Complete	<u>X</u>		
Job No.:	4L0194		Date:	4/14/2004			Preliminary			
Specification:	PT 24	Ter	perature(°C):	22						
Tested By:	David Light	Polotive	Humidity(%)	40						
E U T		Kelduve	finding(%)	40						
E.U.I.:	ORION									
Configuration:	TX FULL POW	ER								
Sample Number:	1		_							
Location:	Lab 1			RBW: R	efer to plots		Measuremen	t		
Detector Type:	Peak			VBW: R	efer to plots		Distance	NA 1	n	
51					<u> </u>					
Test Equipm	ent Used									
Antenna:			Directi	onal Coupler:						
Pre-Amp:				Cable #1:	1626					
Filter:				Cable #2:						
D:'	1026			C-1-1- #2:						
Receiver:	1030			Cable #5:						
Attenuator #1	1467			Cable #4:						
Attenuator #2:	1478			Mixer:						
Additional equip	ment used:									
Measurement Un	certainty: +	-/-1.7 dB								
		Marker	1 1 1 1 1		RBW	<u>3 k</u>	HZ RE	- <u>Att</u>	30 dB	
	1.2.1	indi itali	17	02 dBm	VBU	3 1	(H∠ 10) (H→		38 GD	
			4 05000							
40	abm		1.850200	JUU GHZ	541	∠45 m	is ur	זור	abr	1
40 30).9 dB O1	ffset				▼1	[T1]	17	and dBm	
0.0						• 1	1111		.92 060	A
20								1.85020	UUU GHZ	
30							1			
20							1.			
20						1	I. Marke			
						1.1.644		1. 1		
10							r (* 1)			
10	EM									1 MA
1.11						V		м.,		1.1.1
0								YM.		
_										
					N.				1	EXT
-10			_						M	
LOB	NDEDG								15.	
					. 1				Mar an	
-20				- Met	<u>/'</u>					
				N~ N.						
				Nº O						
-30			-							
				M						
			1 M	T .						
-40										
		واللبرية والمترا	M	1					1	
	a alma da	MUMALMAN	, vi	1					1	
-50										
				1					1	
	top 1 85	<u>с</u> н-	•		• クトーレロット		- 		1625	
				ur.0300	ZJ KUZ/		apar	, ura.st	UZU KHZ	
⊅ate:	14.AP	r.2004 0	9:29:46							
Notes:	Lower band e	dge - Tx 1850.2 M	Hz - Lowest c	hannel						
	Tx at 28.9 dB	m								

Test Data – Spurious Emissions at Antenna Terminals



Test Data – Spurious Emissions at Antenna Terminals

Page 2 of 4 Date: #142004 pecification: MT24 Temperature(*C): 22 Colspan="2">Colspan="2"Colspa="2"Colspan=""2"Colspan="2"Colspan="2"Colspan=	Data Plot			<u>Spur</u>	ious Emis	sions at A	ntenna T	erminals	5			
Onlightation: TXFULLPOWER Ref Lv1 29,03 dBm YBW 1 MHz RF Att 20 dBm 30 dBm 1.88020000 GHz SWT 200 ms Unit dBm 30 dBm 1.88020000 GHz SWT 200 ms Unit dBm 30 dBm 1.88020000 GHz SWT 200 ms Unit dBm 30 dBm 1.88020000 GHz SWT 200 ms Unit dBm 20 9 dB Offset 1.88020000 GHz SWT 200 ms Unit dBm 10 1.88020000 GHz SWT 1.88020000 GHz SWT 1.88020000 GHz 10 1.980 Gffset 1.88020000 GHz SWT 1.88020000 GHz SWT -10 0.1 -13 dBm 1.997 GHz/ Stop 20 GHz SWT -30	Page 3 of 4 Job No.: 4L0194 Specification: PT 24 Tested By: David Light E.U.T.: ORION			Temp Relative F	Date: 4/1 erature(°C): 22 Iumidity(%) 40	4/2004						
Marker 1 (11) RBW 1 MHz RF Att 20 dB 30 dBm 1.88020000 GHz SWT 200 ms Unit dBm 30 dBm 1.88020000 GHz SWT 200 ms Unit dBm 20 dB 0ffset 1 1.11 29.03 dBm 1.68020000 GHz 1.68020000 GHz 20 dB 0ffset 1 1.11 1.68020000 GHz 1.68020000 GHz 1.68020000 GHz 20 dB 0 0 1 1.68020000 GHz 1.68020000 GHz 1.68020000 GHz 20 dB 0 0 0 0 1.68020000 GHz 1.68020000 GHz 10 dBm 0 0 0 0 0 1.68020000 GHz EX1 -10 D1 -11 dBm 0 0 0 0 0 0 0 EX1 -20 dBm 0 0 0 0 0 0 0 EX1 -30 dBm 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Configuration:	TX FU	LL POWER									
30 30.9 BB Offset 1 [T1] 29.03 dBm 20 1.88020000 GHz 1.88020000 GHz 1.88020000 GHz 10 1 1 1 1 10 1 1 1 1 1 10 1 1 1 1 1 1 10 1 1 1 1 1 1 10 1 -13 0 1 1 1 1 -20 1 1 0 1 1 1 1 1 -30 1 -13 0 1<	Ref 30	L∨l dBmj		Marker 1	1 LT1J 29. 1.880200	03 dBm 00 GHz	RBW VBW SWT	1 1 1 1 200 r	1Hz R 1Hz ns L	F Att Init	20 dB dBr	n
10 10 <td< td=""><td>30 30 20</td><td>.9</td><td>dB Offse</td><td>et</td><td></td><td></td><td></td><td>▼1</td><td>[⊤1]</td><td>29</td><td>9.03 dBm)000 GHz</td><td>A</td></td<>	30 30 20	.9	dB Offse	et				▼1	[⊤1]	29	9.03 dBm)000 GHz	A
1VIEW Image: Constraint of the second of	10											-
-10 -10 -10 -13 -20 -30 -40 -40 -50 -50 -50 -50 -50 -50 -50 -5		EW										1 MA
-30 -30 -40 -40 -50 -50 -50 -50 -50 -50 -50 -5	-10 	-13	dBm——									ЕХТ
-40 -50 -50 -50 -50 -50 -50 -70 Start 30 MHz 1.997 GHz/ Stop 20 GHz ate: 14.APR.2004 09:36:55 Notes: Marker indicates carrier at 1880.2 MHz Tx 29.2 dBm	-30 -30	men	Nerrow	mar M	which	mm	mon	www.Mah	m	mun	man	
-50 -50 -60 -70 Start 30 MHz 1.997 GHz/ Stop 20 GHz ate: 14.APR.2004 09:35:55 Notes: Marker indicates carrier at 1880.2 MHz Tx 29.2 dBm	-40											-
-50 -70 Start 30 MHz 1.997 GHz Stop 20 GHz ate: 14.APR.2004 09:36:55 Notes: Marker indicates carrier at 1880.2 MHz Tx 29.2 dBm	-50											-
Start 30 MHz 1.997 GHz/ Stop 20 GHz ate: 14.APR.2004 09:36:55 9:36:55 Notes: Marker indicates carrier at 1880.2 MHz Tx 29.2 dBm	-60											
Notes: Marker indicates carrier at 1880.2 MHz Tx 29.2 dBm	-ru n Star ate:	rt 30 1	D MHz 4.APR.2	004 09	:36:55	1.997	GHz/	·	·	Stop	5 20 GHz	•
	Notes:	Marke Tx 29.	er indicates ca 2 dBm	nrrier at 1880	.2 MHz							

Section 6. Field Strength of Spurious

NAME OF TEST: Field Strength of Spurious	PARA. NO.: 2.1053
TESTED BY: David Light	DATE: 3/11/05

Test Results: Complies.

Test Data:

See attached table.

Test Data - Radiated Emissions

			Field	Strength of	Spurious	Emission	<u>S</u>		
Page 1 o	of <u>2</u>						Complete	X	_
Job No.:	4L0194		Date:	3/11/05			Preliminary		
Specification:	PT 24		Temperature(°C):				_		
Tested By:	David Light		Relative Humidity(%)	35					
E.U.T.:	Orion		-			_			
Configuration:	Tx full powe	er at 1880.2 MHz				_			
Sample No:	1					-			
Frequency	Meter	Correction	Pre-Amp	Substitution	Limit	EIRP	EIRP	Polarity	Comments
	Reading	Factor	Gain	Antenna Gain					
(MHz)	(dBm)	(dB)	(dB)	(dBi)	(dBm)	(dBm)	(mW)		
3760.4	-71.0	35.5	0	10.7	-13	-24.8	0.0033	Н	Noise Floor
5640.6	-68.0	37.8	33	11.4	-13	-51.8	0.0000	Н	
7520.8	-57.0	41.5	32.5	11.3	-13	-36.7	0.0002	Н	
9401	-71.0	42.3	34.5	11.7	-13	-51.5	0.0000	Н	Noise Floor
11281.2	-67.0	47.0	34.6	12.5	-13	-42.1	0.0001	Н	
13161.4	-72.0	47.8	35.3	11.9	-13	-47.6	0.0000	Н	Noise Floor
15041.6	-72.0	47.7	32.7	12.8	-13	-44.2	0.0000	Н	Noise Floor
16921.8	-71.0	49.3	33.3	14.5	-13	-40.5	0.0001	Н	Noise Floor
3760.4	-75.0	43.3	0	10.7	-13	-21.0	0.0080	V	
5640.6	-60.0	39.8	33	11.4	-13	-41.8	0.0001	V	
7520.8	-62.0	41.8	32.5	11.3	-13	-41.4	0.0001	V	
9401	-71.0	41.3	34.5	11.7	-13	-52.5	0.0000	V	Noise Floor
11281.2	-62.0	43.7	34.6	12.5	-13	-40.4	0.0001	V	
13161.4	-71.0	45.8	35.3	11.9	-13	-48.6	0.0000	V	Noise Floor
15041.6	-72.0	45.2	32.7	12.8	-13	-46.7	0.0000	V	Noise Floor
16921.8	-71.0	46.0	33.3	14.5	-13	-43.8	0.0000	V	Noise Floor
Notes									-

Photographs of Test Setup



Section 7. Frequency Stability

NAME OF TEST: Frequency Stability	PARA. NO.: 24.235
TESTED BY: David Light	DATE: 4/15/04

Test Results: Complies.

Measurement Data:Standard Test Frequency: 1880.252740 MHzStandard Test Voltage: 3.6 Vdc

Test Data – Frequency Stability

Frequency Stability							
Page 1 of	1						
Job No.:	4L0194 Date: 4/15/2004						
Specification:	PT 24	Temp	Temperature(°C): 22				
Tested By:	David Light	Relative H	Iumidity(%)	40			
E.U.T.:	Orion						
Configuration:	Tx at center band						
Sample Number:	1						
		<u>Test Equip</u>	oment Used				
Antenna:	#N/A		Direc	ctional Coupler:			
Pre-Amp:	#N/A			Cable #1:	1626		
Filter:	#N/A			Cable #2:			
Receiver:	1026						
Attenuator #1	1478						
Attenuator #2:	#N/A						
Measurement	1 10-17	C.		(F	1000		N / T
Uncertainty:	1x10 ppm	Star	ndard Tes	t Frequency	1880.	252740	MHZ
	Moneurod		Toot	Frequency	Limit	Frror	
Temp (^o C)	Measured Frequency (MHz)		Test Voltage	Freqeuncy Error (Hz)	Limit (+/-Hz)	Error (ppm)	Comment
Temp (^oC)	Measured Frequency (MHz)		Test Voltage	Freqeuncy Error (Hz)	Limit (+/-Hz) 4700.6	Error (ppm)	Comment
Temp (^o C)	Measured Frequency (MHz) 1880.252740 1880.252700		Test Voltage 3.6 3.06	Freqeuncy Error (Hz) 0 -40	Limit (+/-Hz) 4700.6 4700.6	Error (ppm) 0.0	Comment
Temp (°C) 20 20 20 20	Measured Frequency (MHz) 1880.252740 1880.252700 1880.252715		Test Voltage 3.6 3.06 4.14	Freqeuncy Error (Hz) 0 -40 -25	Limit (+/-Hz) 4700.6 4700.6 4700.6	Error (ppm) 0.0 0.0 0.0	Comment
Temp (°C) 20 20 20 20	Measured Frequency (MHz) 1880.252740 1880.252700 1880.252715		Test Voltage 3.6 3.06 4.14	Freqeuncy Error (Hz) 0 -40 -25	Limit (+/-Hz) 4700.6 4700.6 4700.6	Error (ppm) 0.0 0.0 0.0	Comment
Temp (°C) 20 20 20 20 50 50	Measured Frequency (MHz) 1880.252740 1880.252700 1880.252715 1880.252090		Test Voltage 3.6 3.06 4.14 3.6	Freqeuncy Error (Hz) 0 -40 -25 -25	Limit (+/-Hz) 4700.6 4700.6 4700.6 4700.6	Error (ppm) 0.0 0.0 0.0 -0.3	Comment
Temp (°C) 20 20 20 - 50 40	Measured Frequency (MHz) 1880.252740 1880.252700 1880.252715 1880.252090 1880.252090 1880.251250		Test Voltage 3.6 3.06 4.14 3.6 3.6 3.6	Freqeuncy Error (Hz) 0 -40 -25 -25 -650 -1490	Limit (+/-Hz) 4700.6 4700.6 4700.6 4700.6 4700.6	Error (ppm) 0.0 0.0 0.0 -0.3 -0.8	Comment
Temp (°C) 20 20 20 50 40 30	Measured Frequency (MHz) 1880.252740 1880.252700 1880.252715 1880.252090 1880.251250 1880.252960		Test Voltage 3.6 3.06 4.14 3.6 3.6 3.6 3.6 3.6	Freqeuncy Error (Hz) 0 -40 -25 -25 -25 -25 -1490 220	Limit (+/-Hz) 4700.6 4700.6 4700.6 4700.6 4700.6	Error (ppm) 0.0 0.0 0.0 -0.3 -0.8 0.1	Comment
Temp (°C) 20 20 20 20 50 40 30 30	Measured Frequency (MHz) 1880.252740 1880.252700 1880.252715 1880.252090 1880.252090 1880.251250 1880.252960		Test Voltage 3.6 3.06 4.14 3.6 3.6 3.6 3.6	Freqeuncy Error (Hz) 0 -40 -25 -650 -1490 220	Limit (+/-Hz) 4700.6 4700.6 4700.6 4700.6 4700.6	Error (ppm) 0.0 0.0 -0.3 -0.8 0.1	Comment
Temp (°C) 20 20 20 20 50 40 30 10	Measured Frequency (MHz) 1880.252740 1880.252700 1880.252715 1880.252090 1880.251250 1880.252960 1880.252990		Test Voltage 3.6 3.06 4.14 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6	Freqeuncy Error (Hz) 0 -40 -25 -25 -650 -1490 220 220 -3750	Limit (+/-Hz) 4700.6 4700.6 4700.6 4700.6 4700.6 4700.6 4700.6	Error (ppm) 0.0 0.0 -0.3 -0.8 0.1 -2.0	Comment
Temp (°C) 20 20 20 20 50 40 30	Measured Frequency (MHz) 1880.252740 1880.252700 1880.252705 1880.252705 1880.252090 1880.251250 1880.252960 1880.248990 1880.250300		Test Voltage 3.6 3.06 4.14 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6	Freqeuncy Error (H2) 0 -40 -25 -25 -650 -1490 220 220 -3750 -2440	Limit (+/-Hz) 4700.6 4700.6 4700.6 4700.6 4700.6 4700.6 4700.6 4700.6	Error (ppm) 0.0 0.0 0.0 -0.3 -0.8 0.1 -2.0 -1.3	Comment
Temp (°C) 20 20 20 20 50 40 30	Measured Frequency (MHz) 1880.252740 1880.252700 1880.252700 1880.252700 1880.252700 1880.252700 1880.252700 1880.252700 1880.252090 1880.251250 1880.252960 1880.248990 1880.250300 1880.249873		Test Voltage 3.6 3.06 4.14 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6	Freqeuncy Error (Hz) 0 -40 -25 -25 -25 -25 -25 -25 -25 -25 -25 -220 -3750 -2440 -2867	Limit (+/-Hz) 4700.6 4700.6 4700.6 4700.6 4700.6 4700.6 4700.6 4700.6 4700.6	Error (ppm) 0.0 0.0 0.0 -0.3 -0.3 -0.8 0.1 -2.0 -1.3 -1.5	Comment
Temp (°C) 20 20 20 20 50 40 30 - 10 0 -10 -20	Measured Frequency (MHz) 1880.252740 1880.252700 1880.252700 1880.252700 1880.252700 1880.252700 1880.252090 1880.251250 1880.252960 1880.248990 1880.250300 1880.249873 1880.255500		Test Voltage 3.6 3.06 4.14 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6	Freqeuncy Error (Hz) 0 -40 -25 -25 -650 -1490 220 -3750 -3750 -2440 -2867 2760	Limit (+/-Hz) 4700.6 4700.6 4700.6 4700.6 4700.6 4700.6 4700.6 4700.6 4700.6 4700.6	Error (ppm) 0.0 0.0 0.0 -0.3 -0.3 -0.8 0.1 -2.0 -1.3 -1.5 1.5	Comment
Temp (°C) 20 20 20 20 50 40 30 - 10 - -10 - -30 -	Measured Frequency (MHz) 1880.252740 1880.252700 1880.252700 1880.252700 1880.252700 1880.252700 1880.252090 1880.251250 1880.252960 1880.250300 1880.248990 1880.250300 1880.255500 1880.255500 1880.251746		Test Voltage 3.6 3.06 4.14 3.6	Freqeuncy Error (Hz) 0 -40 -25 -25 -650 -1490 220 220 -3750 -2440 -2867 2760 -994	Limit (+/-Hz) 4700.6 4700.6 4700.6 4700.6 4700.6 4700.6 4700.6 4700.6 4700.6 4700.6 4700.6 4700.6	Error (ppm) 0.0 0.0 0.0 -0.3 -0.8 0.1 -2.0 -1.3 -1.5 1.5 -0.5	Comment
Temp (°C) 20 20 20 20 50 40 30 - -10 - -20 - -30 Notes:	Measured Frequency (MHz) 1880.252740 1880.252700 1880.252700 1880.252715 1880.252090 1880.251250 1880.252960 1880.250300 1880.248990 1880.2550300 1880.255500 1880.251746		Test Voltage 3.6 3.06 4.14 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6	Freqeuncy Error (Hz) 0 -40 -25 -650 -1490 220 -3750 -2440 -2867 2760 -994	Limit (+/-Hz) 4700.6 4700.6 4700.6 4700.6 4700.6 4700.6 4700.6 4700.6 4700.6 4700.6 4700.6	Error (ppm) 0.0 0.0 -0.3 -0.8 0.1 -2.0 -1.3 -1.5 1.5 -0.5	Comment

Section 8. Test Equipment List

April 2004

Nemko ID	Description	Manufacturer Model Number	Serial Number	Calibration Date	Calibration Due
1467	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
1626	CABLE, 5 ft	MEGAPHASE 10311 1GVT4	N/A	CBU	N/A
1036	SPECTRUM ANALYZER	ROHDE & SCHWARZ FSEK30	830844/006	03/29/04	03/29/06
1464	Spectrum analyzer	Hewlett Packard 8563E	3551A04428	02/11/03	02/11/05
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
1036	SPECTRUM ANALYZER	ROHDE & SCHWARZ FSEK30	830844/006	02/11/03	02/11/05
1016	Pre-Amp	HEWLETT PACKARD 8449A	2749A00159	10/27/03	10/26/04
283	Environmental Chamber with controller # 1189006	ENVIROTRONICS SH27 & 2030-22844	129010083	04/22/03	04/21/04
1026	FREQUENCY COUNTER	HEWLETT PACKARD 5350B	8232A01493	01/23/04	01/22/05

March 2005

Nemko ID	Description	Manufacturer Model Number	Serial Number	Calibration Date	Calibration Due
1484	Cable 2.0-18.0 Ghz	Storm PR90-010-072	N/A	08/26/04	08/26/05
1485	Cable 2.0-18.0 Ghz	Storm PR90-010-216	N/A	08/02/04	08/02/05
1464	Spectrum analyzer	Hewlett Packard 8563E	3551A04428	01/14/05	01/15/07
1016	Pre-Amp	HEWLETT PACKARD 8449A	2749A00159	11/12/04	11/12/05
1304	HORN ANTENNA	ELECTRO METRICS RGA-60	6151	09/22/03	09/22/05
791	PREAMP, 25dB	ICC LNA25	398	11/12/04	11/12/05
1983	CABLE	KTL Site A OATS	N/A	03/11/04	03/11/05
759	ANTENNA, LOG PERIODIC	A.H. SYSTEMS SAS-200/510	556	07/23/04	07/23/05
760	Antenna biconical	Electro Metrics MFC-25	477	06/22/04	06/22/05

ANNEX A - TEST METHODOLOGIES

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:	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:

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.

NAME OF TEST: Occupied Bandwidth

PARA. NO.: 2.1049

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

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 Per ANSI/J-STD-008

RBW: 1 MHz (> 1 MHz from Band Edge) RBW: 20 kHz (< 1MHz from Band Edge) VBW: ≥ 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: ≥ 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: ≥ 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: 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.

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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: 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



Nemko USA

EQUIPMENT: GSM0110

Para. No. 2.995 - Frequency Stability

