NEMKO Test Report No.:	1L0129RUS1
Applicant:	Andrew Corporation
Equipment Under Test:	PCS Side-to-Side REPEATER
FCC ID:	KUWPCS1900
In Accordance With:	FCC Part 24, Subpart E Broadband PCS Repeaters
Tested By:	NEMKO Dallas Inc. 802 N. Kealy Lewisville, Texas 75057-3136
Authorized By:	Tom Tidwell, RF Group Manager
Date:	5/6/01

Total Number of Pages:

91

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EQUIPMENT:	PCS Side-to-Side Repeater		
FCC ID:		PROJECT NO.:	1L0129RUS

## Section 1. Summary of Test Results

- Manufacturer: Andrew Corporation
- Model No.: PCS Side-to-Side Repeater
- Serial No.: None

Results

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.

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New SubmissionProduction UnitClass II Permissive ChangePre-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

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PROJECT NO.: 1L0129RUS1

## Summary Of Test Data

	PARA.			
NAME OF TEST	NO.	SPEC.	MEAS.	RESULT
RF Power Output	24.232	100W	+20 dBm eirp	Complies
Occupied Bandwidth (CDMA)	24.238	Input/Output	Plots	Complies
Occupied Bandwidth (GSM)	24.238	Input/Output	Plots	Complies
Occupied Bandwidth (NADC)	24.238	Input/Output	Plots	Complies
Spurious Emissions at Antenna	24 228(a)	12 dDm	> 12 dDm	Complias
Terminals	24.230(a)	-15 ubili	>-15 ubiii	Complies
Field Strength of Spurious	24.228(a)	-13 dBm	> 12 dBm	Complies
Emissions	24.230(a)	E.I.R.P.	>-15 ubiii	Complies
Frequency Stability	24.235	N/A	N / A	N / A

#### Footnotes:

(1) Modulation characteristics were not tested since the E.U.T. processes but does not produce a modulated waveform.

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

## EQUIPMENT: PCS Side-to-Side Repeater FCC ID:

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# Section 2. General Equipment Specification

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	
		CDMA	GSM	NADC
Type of Modulation and	Designator:	(G7W)	(GXW)	(DXW)
				$\bowtie$
Output Impedance:		50 ohms		
Max Input:		0 dBm		
	TT 1º 1			
KF Output (Kated):	Uplink	Total:	+15 dBm	
RF Output (Rated):	Downlink	Total	15 dDm	
		I otal:	+15 dBm	
Frequency Translation.		F1-F1	F1-F2	N/A
rrequency rranslation.		$\bowtie$		
Dand Calast		Software	Duplexer	Fullband
band Selection:				

# EQUIPMENT: PCS Side-to-Side Repeater FCC ID:

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## **Modifications Made During Testing**

There were no modifications made during testing.

#### EQUIPMENT: PCS Side-to-Side Repeater FCC ID:

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Description of Operation

The EUT is a PCS band signal enhancer. The enhancer is essentially an off-air amplifier. The signal that is repeated is repeated on the same signal on which it was received. The function of the EUT is to fill in weak signal areas within a commercial building. The unit is built so that it can be re-located with minimum effort by an installer. The maximum eirp is 100 mW (+20 dBm).



## EQUIPMENT: PCS Side-to-Side Repeater FCC ID:

PROJECT NO.: 1L0129RUS1

## Section 3. RF Power Output

NAME OF TEST: RF Power Output

TESTED BY: Chinda PoyTTidwell

PARA. NO.: 2.1046

DATE: 4/25/01

Test Results: Complies.

#### **Measurement Data:**

	Modulation	Per Channel Output Power	<b>Composite Output Power</b>
	Туре	( <b>dBm</b> )	( <b>dBm</b> )
Uplink	CDMA	11.9 dBm	14.9 dBm
Downlink	CDMA	11.7 dBm	14.7 dBm
Uplink	GSM	10.8 dBm	13.8 dBm
Downlink	GSM	10.5 dBm	13.5 dBm
Uplink	NADC	13.7 dBm	16.7 dBm
Downlink	NADC	13.4 dBm	16.4 dBm

**Equipment Used:** 1036-1477-1082

Measurement Uncertainty: +/- 1.6 dB

**Temperature:** 22 °C

Relative 30 % Humidity:

## EQUIPMENT: PCS Side-to-Side Repeater FCC ID:

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## Section 4. Occupied Bandwidth

NAME OF TEST: Occupied Bandwidth (CDMA)	PARA. NO.: 2.1049
TESTED BY: Chinda PoyTTidwell	DATE: 4/25/01

- Test Results: Complies.
- **Test Data:** See attached plot(s).
- **Equipment Used:** 1036-1477-1082
- **Measurement Uncertainty:** +/- 1.6 dB

**Temperature:** 22 °C

Relative 30 % Humidity:

# EQUIPMENT: PCS Side-to-Side Repeater

Test Data --- Occupied Bandwidth – CDMA

FCC ID:

PROJECT NO.: 1L0129RUS1

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Page 1 of	f <u>4</u>							Co	mplete	e X	_	
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ecification:	2.1049		Temp	erature(°C): 22							_	
ted By:	Chinda	Poy	Relative H	Iumidity(%) 30								
LT.:	PCS Re	peater		<u> </u>								
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st Equipm	ent Use	<u>d</u>										
enna:				Directio	onal Coupler:							
Amp:					Cable #1:	1082						
er:					Cable #2:							
eiver:	103	6			Cable #3:							
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# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

PROJECT NO.: 1L0129RUS1

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Page <u>2</u> of ob No.:	of 4 1L0129 2.1	PR	Temp	Date: $\frac{4/2}{2}$	5/01						
Fested By: E.U.T.:	Chinda PCS Re	Poy peater MA SIGNAI	Relative H	umidity(%) <u>30</u>							
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-20	⁺ Lvl ) dBm					VBW SWT	30 k 7 m	Hz M s Ui	ixer nit	-10 dBr dBr	ו י <b>ר</b>
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Notes:	Input DOW	power CDMA NLINK									

# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

PROJECT NO.: 1L0129RUS1

Data Plo	ot Occi	ipied Ban	dwidth C	DMA							
Page <u>3</u> Job No.: Specification: Tested By: E.U.T.: Configuration:	of <u>4</u> <u>1L0129</u> <u>2.1049</u> <u>Chinda</u> <u>PCS Re</u> <u>TX CDI</u>	R Poy peater MA SIGNAL	Tempe Relative Hu	Date: 4/2: rature(°C): 22 umidity(%) 30	5/01						
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Date:	Outout	25.APR.2	001 13	:52:31							
Notes:	UPLIN	K	1								

# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

PROJECT NO.: 1L0129RUS1

Test Plot:	Occu	pied Ban	dwidth C	DMA							
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# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

PROJECT NO.: 1L0129RUS1

Data Plot	Occu	pied Ban	dwidth C	CDMA							
Page 1 o	of <u>4</u>							Complete	Х		
Job No.:	1L0129	R		Date: 4/24	4/01			Preliminary			
Specification:	2.1049		Tempe	erature(°C): 24							
Tested By:	Chinda P	оу	Relative H	lumidity(%) 35							
E.U.T.:	PCS Rep	eater									
Configuration:	TX CDM	IA SIGNAL									
Sample Number	: S01										
Location:	Lab 1				RBW: R	efer to plots					
Detector Type:	Peak				VBW: R	efer to plots					
Test Equipm	ent Used										
Antenna:				Directio	nal Coupler:						
Pre-Amp:					Cable #1:	1082					
Filter:					Cable #2:						
Receiver:	1036				Cable #3:						
Attenuator #1	1477				Cable #4:						
Attenuator #2:					Mixer:						
Additional equip	oment used:										
Measurement U	ncertainty:	+/-3.6 dl	3								
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# EQUIPMENT: PCS Side-to-Side Repeater

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PROJECT NO.: 1L0129RUS1

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By: <u>Cimilar POy</u> Relative Humidity(%) <u>33</u> <u>PCS Repeater</u> rration: <u>TX CDMA SIGNAL</u> Ref L v 1 vBW -30 dBm SWT	
ration: <u>TX CDMA SIGNAL</u> Ref L v 1	
Ref Lv1     VBW       -30 dBm     SWT       30	
Ref Lv1       VBW         -30 dBm       SWT         40	
Ref Lv1     VBW       -30 dBm     SWT       30	
-30 dBm SHT	30 kHz Mixer -10 dBm
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otes: Input power CDMA	
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# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

PROJECT NO.: 1L0129RUS1

Data P	Plot Occu	upied Ban	dwidth C	DMA							
Page Job No.: Specification Tested By: E.U.T.: Configuration	<u>3 of 4</u> <u>1L0129</u> n: <u>2.1049</u> <u>Chinda</u> <u>PCS Re</u> on: <u>TX CD</u>	R Poy peater MA SIGNAL	Tempe Relative H	Date: 4/24 crature(°C): 24 umidity(%) 35	4/01						
R R	.ef Lvl 31.5 d	Bm				RBW VBW SWT	30 k 30 k 7 m	Hz Rf Hz M Is Ur	- Att ixer hit	20 dB -10 dBm dBm	1
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Notes:	: <u>Outpu</u> UPLIN	t signal CDM. M	4								

# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

PROJECT NO.: 1L0129RUS1

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Job No.: Specificatio	<u>1L01</u> 2.10	29K	Temp	Date: $\frac{4/24}{24}$	4/01						
Tested By:	Chin	da Pov	Relative H	$\frac{24}{100}$ umidity(%) 35							
E.U.T.:	PCS	Repeater		(/// <u></u>							
Configurati	ion: TX C	DMA SIGNAL									
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## EQUIPMENT: PCS Side-to-Side Repeater FCC ID:

PROJECT NO.: 1L0129RUS1

NAME OF TEST: Occupied	l Bandwidth (GSM)	PARA. NO.: 2.1049
TESTED BY: Chinda PoyT	Tidwell	DATE: 4/25/01
Test Results:	Complies.	
Test Data:	See attached plot(s).	
<b>Equipment Used:</b> 1036-1	477-1082	
Measurement Uncertainty:	+/- 1.6 dB	
Temperature: 22	°C	
Relative30Humidity:	%	

# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

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ta Plot	Occu	pied Ba	ndwidth	GSM						
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No.:	1L0129	₽R		Date: 4	/25/01			Prelimin	arv	
ification:	2.1049		Te	mperature(°C): 2	22					
ed Bv:	Chinda P	ov	Relativ	e Humidity(%)	30					
т.:	PCS Rep	eater		<u> </u>						
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t Equipm	ent Used	<u>l</u>								
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Amp:					Cable #1:	1082				
r:					Cable #2:					
eiver:	1036				Cable #3:					
nuator #1	1477				Cable #4:					
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inuator #2:					wiixer:					
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surement Un	certainty:	+/-3.6	dB							
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10 0 1V -10 -20 -30 -40 -50 Certe:	IEW Motor Iter	1.9877 5.APR.	GHz 2001	13:25:26		KHz/			Span	800 KHz
10 0 1V -10 -20 -30 -30 -40 -50 -50 Cer te: Notes:	IEW Motor 2 Output	1.9877 5.APR.	GHz 2001	13:25:26		kHz/			Span	BOO KHZ

# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

PROJECT NO.: 1L0129RUS1

Data Plot Occup	ied Bandwidth G	<u>SM</u>						
Page 2 of 4           Job No.:         1L0129R           Specification:         2.1           Tested By:         Chinda Poy           E.U.T.:         PCS Repeat           Configuration:         TX GSM S	Tempe Relative H ter IGNAL	Date: 4/25/01 rature(°C): 22 umidity(%) 30						
Ref Lvl -20 dBm			RBW VBW SWT	30 k 30 k 5 m	Hz RF Hz M Is Ur	F Att ixer hit	30 dB -10 dBn dBn	1
- 30								
-40			la					
-50 1VIEW -60	۸_				4			1 MA
_ 70 مەسەمەر مەر	I what are and the for the second second				<u>ل</u> ر لارم	L.D	مهليدميطعنا	EXT
-80								
- 100								
- 1 10								j
Center 1 Date: 25 Notes: Input pow	.9877 GHz .APR.2001 13 wer GSM	:27:56	80 kHz/			Span	800 kHz	
DOWNLI	NK							

# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

PROJECT NO.: 1L0129RUS1

Data Plo	t Occu	ipied Ban	dwidth G	SM							
Page <u>3</u> Job No.: Specification: Tested By: E.U.T.: Configuration:	of 4 1L01291 2.1049 Chinda 1 PCS Rep TX GSM	R Poy Deater I SIGNAL	Tempe Relative Hu	Date: 4/2: rature(°C): 22 umidity(%) 30	5/01						
Re 3	f Lvl 1.5 df	Зm				RBW VBW SWT	30 k 30 k 5 m	Hz Ri Hz M s Ur	F Att ixer hit	30 dB -10 dBm dBm	1
30 20 10 -10 -20 -30 -40 -50 -60 Cer Date:	21.5 (IEW (IEW)	1.8977 1	эт 	: 33 : 56		<hz <="" th=""><th></th><th></th><th>5pan</th><th>800 KHz</th><th>1MA EXT</th></hz>			5pan	800 KHz	1MA EXT
Notes:	Output UPLIN	signal GSM	001 13								

# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

PROJECT NO.: 1L0129RUS1

Test P	Plot:	Occu	pied Ba	andwi	dth G	SM							
Page Job No.: Specificatie Tested By: E.U.T.: Configurat	e <u>4</u> of on:	4 1L01291 2.1049 Chinda l PCS Rej TX GSM	R Poy Deater A SIGNAL	Re	Tempe elative Hu	Date: 4/2 rature(°C): 22 umidity(%) 30	5/01						
	Ref -20	L∨l dBm						RBW VBW SWT	30 k 30 k 5 m	Hz Rf Hz M Is Ur	- Att ixer hit	30 dB -10 dBm dBm	ו ז
-30													
-40				_		اب	how	may	h				
-50	1 V I	Eω				www.							1 MA
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-80													
-90				+									
-100													
-110													
-120 Date:	Cen	ter 2	1.8977 1.8977	GHz . 200 1	13	:30:12	80	kHz/		<u> </u>	Span	800 kHz	J
Notes	s:	Input p UPLIN	oower GSM K	[									
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# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

PROJECT NO.: 1L0129RUS1

Data Plot	Occu	pied Ban	dwidth G	SM								
Page <u>1</u> o	of <u>4</u>							Cor	nplete	Х		
Job No.:	1L0129	R		Date: 4/24	4/01			Prelin	ninary			
Specification:	2.1049		Tempe	rature(°C): 24								
Tested By:	Chinda P	oy	Relative Hu	umidity(%) 35								
E.U.T.:	PCS Rep	eater										
Configuration:	TX GSM	SIGNAL										
Sample Number:	S01											
Location:	Lab 1				RBW:	Refer to plots						
Detector Type:	Peak				VBW:	Refer to plots						
Test Equipm	ent Used											
Antenna:				Directio	nal Coupler:							
Pre-Amp:					Cable #1:	1082						
Filter:					Cable #2:							
Receiver:	1036				Cable #3:							
Attenuator #1	1477				Cable #4:							
Attenuator #2:					Mixer:							
Additional equip	ment used:	(0.6 H										
Measurement Or	icertainty:	+/-3.6 df	<u>s</u>									
(i)						RBW	30	кНz	RF 6	≏tt	30 dB	
Ref	f L∨l					VBW	30	кНz	Mixe	∋r	-10 dBn	ſ
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Date:	2	4.APR 2	2001 15	:03:48								
Notes	Outnut	signal CSM		0								
110160.	DOWN	LINK										

# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

PROJECT NO.: 1L0129RUS1

Page <u>2</u> of 4	<u>ccupicu b</u>		<u>101VI</u>							
No.:     1L       cification:     2.1       ted By:     Ch       .T.:     PC       figuration:     TX	0129R inda Poy S Repeater GSM SIGNAL	Tempo Relative H	Date: <u>4/2</u> erature(°C): <u>24</u> umidity(%) <u>35</u>	4/01						
Ref L -20 d	∨l IBm				RBW VBW SWT	30 H 30 H 5 r	(Hz f (Hz f ns l	RF Att Mixer Unit	30 dB -10 dBr dBr	n
-30										-
-40			للمن مر		www. <sub>U</sub> r	hu hu				
-60	ω	<u>س</u>				~				1 MA
- 70	~~~~	to any and						<u> 4</u>	and the second	EXT
-80										
100										-
120										-
Cente ate:	er 1.94 ( 24.APR	GHZ .2001 15	:19:17	80	kHz∕			Spar	800 kHz	
Notes: In	put power GS	M								
D	JWNLINK									

## EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

PROJECT NO.: 1L0129RUS1

#### Data Plot Occupied Bandwidth GSM Page <u>3</u> of 4 1L0129R Date: 4/24/01 Job No.: Specification: 2.1049 Temperature(°C): 24 Relative Humidity(%) 35 Tested By: Chinda Poy E.U.T.: PCS Repeater TX GSM SIGNAL Configuration: Ref Lvl 30 kHz RF Att RBW 30 dB VВЫ 30 kHz Mixer -10 dBm 31.5 dBm SWT 5 ms Unit dBm 30 21.5 DB UTTS 20 10 Nrow C $\hat{w}_{V_{n_{i}}}$ 0 1VIEW 1 MA - 10 ЕΧТ -20 Yng wy -30 1 -40 w Uhr w -50 -60 80 kHz/ Center 1.86 GHz Span 800 kHz Date: 24.APR.2001 15:06:23 Output signal GSM Notes: UPLINK

# EQUIPMENT: PCS Side-to-Side Repeater FCC ID:

PROJECT NO.: 1L0129RUS1

Nemko Nemko Dallas, Inc.			Dalla: E Lewi Tel: Fax:	s Headquarte 802 N. Kealy sville, TX 7509 (972) 436-960 (972) 436-266	rs: 57 50 57		
Test Plot: Occupied Bandwidth G	<u>SM</u>						
Page 4. of 4       Job No.:     1L0129R       Specification:     2.1049       Temper       Tested By:     Chinda Poy       Relative Hu       E.U.T.:     PCS Repeater       Configuration:     TX GSM SIGNAL	Date: 4/24/01 ature(°C): 24 midity(%) 35						
Ref Lv1 -20 dBm		RBW VBW SWT	30 k 30 k 5 m	Hz Rf Hz M s Ur	- Att ixer hit	30 dB -10 dBn dBn	n
-20							]—
- 4 0							
-50 1VIEW	Jumm	www.wr	ملر				1 MA
-70 tother warden with the	owo of the second se		<b>N</b>	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	who wo	<u>مىر ئەممىر</u>	E×T
-80							-
- 100							
-110							-
-120 Center 1.86 GHz	80 +	<hz <="" td=""><td></td><td></td><td>Span</td><td>800 kHz</td><td>J</td></hz>			Span	800 kHz	J
Notes: Input power GSM UPLINK							

## EQUIPMENT: PCS Side-to-Side Repeater FCC ID:

PROJECT NO.: 1L0129RUS1

NAME OF TEST: Occupied Bandwidth (NADC)PARA. NO.: 2.1049										
TESTED BY: Chinda Poyl	Tidwell	DATE: 4/25/01								
Test Results:	Complies.									
Test Data:	See attached plot(s).									
Equipment Used: 1036-1	477-1082									
Measurement Uncertainty:	+/- 1.6 dB									
<b>Temperature:</b> 22	°C									
Relative30Humidity:	%									

#### EQUIPMENT: PCS Side-to-Side Repeater FCC ID:

PROJECT NO.: 1L0129RUS1

Data Plot	Occu	ipied Bai	ndwidth T	DMA							
Page 1 of	f <u>4</u>							Comple	te X		
Job No.:	1L012	9R		Date: 4/2	5/01			Prelimina	ry		
Specification:	2.1049		Tempe	erature(°C): 22							
Tested By:	Chinda l	Pov	Relative H	umidity(%) 30							
E.U.T.:	PCS Re	beater		<u></u>							
Configuration:	TX TD	MA SIGNAL									
Sample Number:											
Location:	Lab	1			RBW:	Refer to plots					
Detector Type:	Peal	<u> </u>			VBW:	Refer to plots					
Test Equipme	ent Useo	1									
Antenna:		_		Directio	onal Coupler:						
Pre-Amp:					Cable #1:	1082					
Filter:					Cable #2.						
Receiver:	1036	5			Cable #3						
Attenuator #1	147	, <u> </u>			Cable #4:						
Attenuator #2:	147	<u>,                                     </u>			Mivor:						
Attenuator #2:					witker:						
Additional equip	ment used		P								
Measurement Un	certainty:	+/-3.6 0	В								
Â						0.811	20				
						RBW	30	KHZ P	H ATT	30 88	
Ker						VBM	30	RHZ I	lixer	-10 084	n
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Cen	ter	1.9875	GHz		80	kHz/			Span	800 kHz	_
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vate:	2	J.HPK.2	. 13	:41:08							
Notes:	Output	signal TDM	A								
	DOWN	LINK									
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# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

PROJECT NO.: 1L0129RUS1

Data I	Plot	Occu	ipied Ba	ndwidt	h TDMA							
Page	e <u>2</u> of	4										
Job No.:		1L0129	R		Date	: 4/25/01						
Specificatio	on:	2.1 Chinda l	Deri	<u> </u>	Femperature(°C)	22						
Tested By:		DCS Day	roy	Rela	tive Humidity(%	) 30						
E.U.I.: Configurati	ion:	TY TD										
conngurati	ion.	IA IDI	IA SIGNAL									
$\frown$							BBW	30 k	Hz R	F Att	30 dB	
F	Ref	Lvl					VBW	30 k	Hz M	ixer	-10 dB	m
· .	-20	dBm					SWT	- m	is U	nit	dB	m
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-80												
-90												
-100				-								_
-110												-
-120												
(	Cen	ter	1.9875	GHz		80	kHz∕			Spar	n 800 kH	Z
Date:		2	5.APR.	2001	13:42:5	59						
Notes	s:	Input p	ower TDM	A								
		DOWN	ILINK									
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# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

PROJECT NO.: 1L0129RUS1

Data I	Plot Oc	cupied Ba	ndwidth T	'DMA							
Page	e <u>3</u> of <u>4</u>	200		D 1/2	5/01						
JOD NO.: Specificatio	n: 2 104	29K	Temp	Date: $\frac{4/2}{2}$	5/01						
Tested By:	Chine	da Pov	Relative H	$\frac{22}{1000}$ umidity(%) 30							
E.U.T.:	PCS	Repeater	_								
Configurati	on: TX T	DMA SIGNAL									
/K						RBW	30 k	Hz RI	- Att	30 dB	
∕€S∕ F	Ref Lv	1				VBW	30 k	Hz M	ixer	-10 dBm	ı
_	31.5	dBm				SWT	5 m	ns Ui	⊐it	dBr	1
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C	_enter	1.8975	ьнz		80 1	KHZ/			Span	8UU KHZ	
Date:		25.APR.2	2001 13	:39:24							
Notes	s: Outj	out signal TDM	A								
	UPL	INK									

# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

PROJECT NO.: 1L0129RUS1

Test Plot: Occupied B	andwidth TDMA					
Page 4 of 4       Job No.:     IL0129R       Specification:     2.1049       Tested By:     Chinda Poy       E.U.T.:     PCS Repeater       Configuration:     TX TDMA SIGNAI	Date: 4/25/01 Temperature(°C): 22 Relative Humidity(%) <u>30</u>					
Ref Lvl -20 dBm		RBW VBW SWT	30 kHz 30 kHz 5 ms	RF Att Mixer Unit	30 dB -10 dBm dBm	
-20 -30 -40 -50 1VIEW -60 -70 -70 -70 -70 -70 -70 -70 -70 -70 -7	GHz 80	kHz/		white the spar		■ . T
Notes: Input signal TDM	IA					
UPLINK						

# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

PROJECT NO.: 1L0129RUS1

Data Plot	Occu	upied Bar	ndwidth T	DMA							
Page 1 o	f <u>4</u>							Complete	X		
ob No.:	1L012	29R		Date: 4/2	4/01			Preliminary	,		
pecification:	2.1049		Tempo	erature(°C): 24				-			
Tested By:	Chinda	Poy	Relative H	umidity(%) 35							
E.U.T.:	PCS Re	peater	_	· · · · .							
Configuration:	TX TD	MA SIGNAL									
ample Number:	S01	1									
location:	Lab	1			RBW:	Refer to plots					
Detector Type:	Pea	k			VBW:	Refer to plots					
<u> Fest Equipm</u>	ent Use	<u>d</u>									
Antenna:				Directio	onal Coupler:						
Pre-Amp:					Cable #1:	1082					
Filter:					Cable #2:						
Receiver:	103	6			Cable #3:						
Attenuator #1	147	7			Cable #4:						
Attenuator #2:					Mixer:						
Additional equip	ment used	1:									
Measurement Un	certainty	+/-3.6 d	B								
/ica						RBW	30 H	Hz RF	- Att	30 dB	
Ref	L v 1					VВW	30 H	Hz M	ixer	-10 dBm	ı
Э1	.5 dł	Зm				SWT	5 m	ns Ur	nit	dBr	ı
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-60											
Cen	ter	1.94 GH			61.	5 kHz/			Span	615 kHz	
Data			0001 14						- 1		
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Notes:	Outpu	t signal TDM	A								
	DOWN	NLINK									

# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

PROJECT NO.: 1L0129RUS1

Index 2 of 4       Job No.:     IL.0129R       Date:     4/24/01       Specification:     2.1       Tested By:     Chinda Poy       E.U.T.:     PCS Repeater       Configuration:     TX TDMA SIGNAL	
Specification:     2.1     Temperature(°C):     24       Tested By:     Chinda Poy     Relative Humidity(%)     35       E.U.T.:     PCS Repeater       Configuration:     TX TDMA SIGNAL	
Tested By:     Chinda Poy     Relative Humidity(%)       E.U.T.:     PCS Repeater       Configuration:     TX TDMA SIGNAL	
E.U.T.: PCS Repeater Configuration: TX TDMA SIGNAL	
Configuration: TX TDMA SIGNAL	
RBW 30 KHZ RF Att 30 dB	
Ref Lvi VBW 30 KHz Mixer -10 dBr	1
-20 dBm SWT 5 ms Unit dBr	1
	I
-30	
	EXT
- 70 how wet have been wet the hast - or the wet and	
-90	
-100	
-110	
-120	
Center 1.94 GHz 61.5 kHz/ Span 615 kHz	-
Date: 24 APR 2001 14:42:02	
Notes: Input power TDMA	
DOMNTINK	

## EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

PROJECT NO.: 1L0129RUS1

Data Plot	Occupie	d Ban	lwidth T	DMA							
Ioh No ·	1L.0129R			Date: 4/24	4/01						
Specification:	2.1049		Tempe	rature(°C): 24							
Tested By:	Chinda Pov		Relative H	umidity(%) 35							
E.U.T.:	PCS Repeater		_								
Configuration:	TX TDMA S	IGNAL									
-											
						RBW	30 K	Hz RF	Att	30 dB	
Ref	Lvl					VBW	30 k	Hz M	ixer	–10 dBr	ı
31	.5 dBm					SWT	5 m	s Ur	nit	dBr	ו
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Cer	iter 1.8	86 GHz			61.5	kHz∕			Span	615 kHz	
Date:	24.	APR.20	01 14	:36:58							
Notes:	Output sign	al TDM A									
110165.	UPLINK										
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# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

PROJECT NO.: 1L0129RUS1

Test P	<u>lot:</u>		pied Ba	ndwid	lth Tl	DMA							
Ioh No ·	<u>+ 01</u>	+ 11.0129F	2			Date: 4/24	1/01						
Specificatio	n: -	2.1049	<u> </u>		Temper	ature(°C): 24							
Tested By:	-	Chinda I	Pov	Re	ative Hu	midity(%) 35							
EUT.	-	PCS Rer	neater	Ref	anve m	many(70) <u>55</u>							
Configuratio	on:	TX TDA	IA SIGNAL										
connguium	-		III DIOI III										
								RBW	30 k	Hz R	F Att	10 dB	
	- 30	dBm						V D W S W T	50 8	s⊓∠ II Ng II	ixer nit		n n
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-130		ter	1 86 6				61 5				5020	615 VHz	
_		-	1.00 0				01.0	11127			opan	010 1012	
Date:		2	4.APR.	2001	14	:34:02							
Notes	:	Input s	ignal TDM	A									
	-	UPLIN	K										
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1	-												

# EQUIPMENT: PCS Side-to-Side Repeater FCC ID:

PROJECT NO.: 1L0129RUS1

## Section 5. Spurious Emissions at Antenna Terminals

NAME OF TEST: Spurious Emissions @ Antenna Terminals	PARA. NO.: 2.1051
TESTED BY: Chinda PoyTTidwell	DATE: 4/25/01

Test Results: Complies.

**Test Data:** See attached plot(s).

**Equipment Used:** 1036-1477-1082

**Measurement Uncertainty:** +/- 1.6 dB

**Temperature:** 22 °C

Relative 30 % Humidity:
# EQUIPMENT: PCS Side-to-Side Repeater

Test Data --- Spurious Emissions at Antenna Terminals

FCC ID:

PROJECT NO.: 1L0129RUS1

Page 1 of	4							Co	mplete X	_	
o.:	1L012	9R		Date:	4/24/01			Preli	minary	_	
ication:	2.1051		Т	emperature(°C):	21						
l By:	Chinda	Poy	Relativ	ve Humidity(%)	46						
.:	PCS Re	peater									
guration:	TX FUI	L POWER									
e Number:											
on:	Lab	1		_	RBW: F	efer to plots					
or Type:	Pea	ς.			VBW: F	efer to plots					
Equipme	ent Use	d									
na:				Dir	ectional Coupler:						
mp:					Cable #1:	1082					
					Cable #2:						
ver:	103	5			Cable #3:						
uator #1	147	7			Cable #4:						
uator #2.					Mixer:						
onal equipr	nent used	l.									
romont Un	nent usee		dD								
irement on	certainty.	+/-3.0	ub								
<b>x</b>			Marke	er 1 [T1	]	RBW	100 H	κΗz	RF Att	30 0	dB
Ref	Lv1			- 3	6.34 dBm	VBW	100 H	Hz	Mixer	-10 0	dBm
41	.5 dl	Зm	8	23.1062	1242 MHz	SWT	З	s	Unit	(	dBm
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70 2	1.5 (	зв отте	Set				▼1	[T1]		36.34 c	Bm
							· ·		823 1063	21242 M	1H7
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20											
10			_								
1 1 1	EΜ										1
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10 D 1	-13	dBm—									
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20				_		<b> </b>					
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20											
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<b>.</b>			1					1	Number of the second		المعادمة
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	4					MU -	1	1			
1.00	ter	515 MH;	Z		97	nHZ/			Spar	א טיצ ר	ΊΗΖ
Cen		4. APR.	2001	8:25:1	3						
e:	2										
e:	2 30MH	7. 1GH7/T	OWNI INI	0							

# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

PROJECT NO.: 1L0129RUS1

<b>Data Plot</b>	SPURIO	US EMISSION	IS AT AN	<b>FENNA</b>	TERMIN	IALS					
Page <u>2</u> o	f <u>4</u>										
Job No.:	1L0129R		Date: 4/24/0	)1							
Specification:	2.1	Tempe	rature(°C): 21								
Tested By:	Chinda Poy	Relative Hu	umidity(%) 46								
E.U.T.:	PCS Repeater										
Configuration:	TX FULL POV	VER									
		Marker	2 [T1]		RBW	1 M	Hz	RF Att	30	dB	
Ret	Lv1		-22.1	8 dBm	VBW	1 M	Hz	Mixer	-10	dBm	
4 3	.5 dBm	1 4	.6312625	i3 GHz	SWT	З	s	Unit		dBm	
40									1		1
		J. 1 5 6 1				₹2	[T1]	-22	2.18	dBm	
								14.63126	5253	GHz	
30						×1	[[]]	20	.46	dBm	
	1							1.95190	381	GHz	
20	<u>Ŷ</u>										
10											
10 1 V	IEW										1 MA
0											
											ЕХТ
- 10											
- 10 D	1 – 13 dB	m									
-20							7				
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- 30	Jardin	marghan and and the second sec			-			· ····································	<b>Pv</b>		
-40											
-50											
											l
Sta	art 1 GH	Z		1.9	GHz/			Stop	20	GHz	
Date:	24.6	PR.2001 8	:26:27								
Notes:	1GHz, 20CH	z (DOWNLINK)									
110165.	Marker 1 inc	licates carrier									
	Marker 2 inc	licates highest emission	on								
	2 III	ingnest emissi									

# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

### PROJECT NO.: 1L0129RUS1

Page <u>3</u> b No.:	of 4 1L0129	R		Date: 4/24	4/01							
ecification:	2.1051	D	Tempe	rature(°C): 21								
sted By:	PCS Re	Poy neater	Relative H	1midity(%) 46								
onfiguration:	TX FUI	L POWER										
Kan har			Marker	1 [⊤1]		RBW	100 k	Hz R	FAtt	30	dB	
KY Re	f Lvl	D	9.5	-36.	29 dBm	VBW	100 k	Hz M	lixer	- 10	dBm	
4	1.5 0	Dm	. 00	.983967	94 MHZ	501	3	5 L			abm	
40	21.5	BB Offs	et				▼ 1	[T1] 8	-36	5.29	dBm <sup> </sup> MH 7	
30								0			11.12	
20												
10 1	/IEW											1 M 4
0												
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- 10	1 - 13	dBm										
-20												
-30									1			
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-40					· · · ·							
50												
- 30												
St	ant 3	0 MHz			97 1	1Hz/			Sto	op 1	GHz	
Date:	:	24.APR.2	2001 8	:21:48								
Notes:	30MH	z - 1GHz (UP	LINK)									
	Marke	r indicates hi	ghest emissior	I								

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### FCC PART 24, SUBPART E BROADBAND PCS REPEATERS

# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

PROJECT NO.: 1L0129RUS1

Test I	Plot:	<u>SPU</u>	RIOUS E	MISSIO	NS AT AN	NTENNA	TERMIN	NALS					
Pag	e <u>4</u> of	f <u>4</u>											
Job No.:		1L0129	)R		Date: 4/2	4/01							
Specificati	ion:	2.1051		Tempe	erature(°C): 21								
Tested By	:	Chinda	Poy	Relative H	umidity(%) 46								
E.U.T.:		PCS Re	epeater										
Configura	tion:	TX FU	LL POWER										
/ix				Marker	2 [T1]		RBW	1 1	IHz	RF Att	30	dB	
Ś	Ref	∟v l			-22.	15 dBm	VВЫ	1 1	IHz	Mixer	- 1 🛛	dBm	I
	41	.5 d	IBm	1 4	4.517034	107 GHz	SWT	З	s	Unit		dBm	I
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	2	1.0						₹2	[[]1]	-2	2.15	dBm	
										14.5170	3407	GHz	
30								×1	[[]1]	2	1.38	dBm	
		1								1.8757	5150	GHz	
20		¥—	-								_		
10													
10	1 V	IΕW											1 MA
0			-								-		
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10													
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-50	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~												
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-50													
00													
	Cen	ter	10.5 GH	z		1.9	GHz/			Spa	n 19	GHz	-
					40.04								
Date			24.APK.2	.001 8	.19:31								
Note	s:	1GHz	- 20GHz (UPI	JNK)									
		Mark	er 1 indicates	carrier									
		Mark	er 2 indicates	highest emissi	on								
1													

# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

### PROJECT NO.: 1L0129RUS1

Data Plot	INT	ERMODU	<b>JLATIO</b>	N CHARA	ACTERI	STICS CI	<b>DMA</b>				
Page <u>1</u> o	f <u>4</u>							Compl	ete X		
Job No.:	1L012	29R		Date: 4/2	5/01			Prelimin	ary		
Specification:	2.1051		Tempo	erature(°C): 22							
Tested By:	Chinda	Роу	Relative H	umidity(%) 30							
E.U.T.:	PCS Re	peater									
Configuration:	TX CD	MA SIGNAL									
Sample Number:	S01	1									
Location:	Lab	1			RBW:	Refer to plots					
Detector Type:	Pea	k			VBW:	Refer to plots					
Test Equipm	ent Use	<u>d</u>									
Antenna:				Directio	onal Coupler:						
Pre-Amp:					Cable #1:	1082					
Filter:					Cable #2:						
Receiver:	103	6			Cable #3:						
Attenuator #1	147	7			Cable #4:						
Attenuator #2:					Mixer:						
Additional equip	ment used	l:	-								
Measurement Ur	certainty:	+/-3.6 d	3								
1 A			Marker	2 [T1]		RBW	30 k	Hz i	RF Att	30 dB	
Ref	Lv1			-41.	22 dBm	VBW	30 k	Hz I	Mixer	–10 dBr	n
21	.5 dl	Зm	1	.984123	325 GHz	SWT	42 m	s l	Jnit	dBn	n
20	1 5		<b>+</b>		-	1				Ŧ	F
<sup>_</sup>	1.0						▼2	[[]]	-43	1.22 dBm	1 <b></b>
									1.98412	2325 GHz	:
10							∨1	[[]1]	-41	I.14 dBm	ĩ
									1.99070	)641 GHz	:
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-50											-
-60						_					-
70											
-70											
Cer	ter	1.99 GH:	z		1.5	MHz/			Spar	ר 15 MHz	-
Date:	2	5.APR.2	001 14	:56:44							
Notes:	CDMA	Intermod U	oper Bandedg	e 50dB (DOV	VNLINK)						
	Marke	r 1 indicates	highest emissi	ion out of ban	d						
	Marke	r 2 indicates l	nighest emissi	on inband							

# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

PROJECT NO.: 1L0129RUS1

#### Data Plot INTERMODULATION CHARACTERISTICS CDMA Page <u>2</u> of <u>4</u> Job No.: 1L0129R Date: 4/25/01 Temperature(°C): 22 2.1 Specification: Tested By: Chinda Poy Relative Humidity(%) 30 E.U.T.: PCS Repeater Configuration: TX CDMA SIGNAL RВЫ 30 kHz RF Att 30 dB Ref Lvl Marker 2 [T1] -41.51 dBm 30 kHz ٧ВЫ Mixer -10 dBm 1.88903307 GHz 42 ms 21.5 dBm SWT Unit dBm 20 21.5 DB Offe ₹2 [T1] -41.51 dBm 1.88903307 GHz -41.61 dBm 10 **7**1 [T1] 1.89555<mark>611 GHz</mark> С лЛÌ 시 -10 <u>т</u>у<u>1</u> Е Ы 3 1 M A dBm -20 ЕΧТ -30 λų -40 Mrn Ų $\Lambda$ л. nmumul -50 -60 - 70 1.5 MHz/ Center 1.895 GHz Span 15 MHz Date: 25.APR.2001 15:05:08 CDMA Intermod Upper Bandedge 50dB (UPLINK) Notes: Marker 1 indicates highest emission out of band Marker 2 indicates highest emission inband

# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

PROJECT NO.: 1L0129RUS1

#### Data Plot INTERMODULATION CHARACTERISTICS CDMA Page 3 of 4 1L0129R Job No.: Date: 4/25/01 Specification: 2.1051 Temperature(°C): 22 Tested By: Chinda Poy Relative Humidity(%) 30 E.U.T.: PCS Repeater TX CDMA SIGNAL Configuration: Marker 1 [ | 1 ] RВЫ 30 kHz RF Att 30 dB Ref Lvl -41.86 dBm νвы 30 kHz Mixer -10 dBm 21.5 dBm 1.99064629 GHz SWT 42 ms Unit dBm 20 21.5 dB Offset **v**<sub>1</sub> [ [ ] ] -41.86 dBm 1.99064629 GHz 10 -41.62 dBr 2 [T1] 1.98412325 GHz С <u>w</u>N ١A -10 1**∵Y1IEW13** dBm 1 M A -20 ЕXТ -30 Mon Purit -40 $\sqrt{1}$ mahuhuhahadha --50 -60 - 70 Center 1.99 GHz 1.5 MHz/ Span 15 MHz Date: 25.APR.2001 14:58:51 CDMA Intermod Upper Bandedge 60dB (DOWNLINK) Notes: Marker 1 indicates highest emission out of band Marker 2 indicates highest emission inband

# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

PROJECT NO.: 1L0129RUS1

Test Plot:	INTE	RMODU	JLATION	N CHARA	ACTERIS	TICS CE	<b>MA</b>				
Page <u>4</u> of	f 4										
Job No.:	1L0129R			Date: 4/2	5/01						
Specification:	2.1051		Tempe	erature(°C): 22							
Tested By:	Chinda Poy	y	Relative H	umidity(%) 30							
E.U.I.: Configuration:	TX CDMA	SIGNAL									
configuration.	TA CDWA	SIGNAL									
			Maaliaa	0 [ ] 1 ]		BBU	20 1			20 45	,
	L V I		nai kei	-40	37 dBm	VBM	30 K	HZ N	iver	-10 dE	, Im
21	.5 dBn	n	1	.889063	13 GHz	SWT	42 m	s Ui	nit	dE	3m
20											7
2	1.5 0	5 01156					▼2	[   1 ]	-40	.37 dB	m 🔳
10									1.88906	313 GH	z
10							$\nabla_1$	[⊤1]	-42	.15 dB	m
									1.89552	боз бн	z
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-50											<u> </u>
-60											_
- 70											_
Cer	ter 1	.895 GH	1Z		1.5	MHZ/			Span	15 MH	z
Date:	25	.APR.2	001 15	:03:08							
Notes:	CDMA I	ntermod Up	per Bandedg	e 60dB (UPL)	INK)						
	Marker 1	indicates h	ighest emissi	on out of ban	d						
	Marker 2	indicates h	ighest emissi	on inband							

# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

# PROJECT NO.: 1L0129RUS1

Data Plot	INTE	RMOD	ULATION	N CHARA	CTERI	STICS CI	DMA				
Page <u>1</u> o	f <u>4</u>							Complete	X		
Job No.:	1L0129	R		Date: 4/2	5/01			Preliminar	/		
Specification:	2.1051		Tempo	erature(°C): 21							
Tested By:	Chinda Po	oy	Relative H	umidity(%) 40							
E.U.T.:	PCS Repe	eater									
Configuration:	TX CDM	A SIGNAL									
Sample Number:	S01										
Location:	Lab 1				RBW: F	efer to plots					
Detector Type:	Peak	_			VBW: F	efer to plots					
Test Equipm	ent Used										
Antenna:				Directio	nal Coupler:						
Pre-Amp:					Cable #1:	1082					
Filter:					Cable #2:						
Receiver:	1036				Cable #3:						
Attenuator #1	1477				Cable #4:						
Attenuator #2:					Mixer:						
Additional equip	ment used:										
Measurement Ur	certainty:	+/-3.6 d	В								
			Marker	2 [T1]		RBW	30 k	Hz RI	= Att	30 dB	
K Ref	∟vl			-40.	64 dBm	VBW	30 k	Hz M	ixer	-10 dBm	n
21	.5 dB	m		1.935365	73 GHz	SWT	З	s U	⊐it	dBr	n
20		8 NFFS	<b>b</b> 1			+					F
	1.5 1	0.10	T '				▼2	[〒1]	- 4 0	.64 dBm	
10									1.93536	573 GHz	
10							∨1	[〒1]	- 4 2	.03 dBm	
									1.92968	437 GHz	
0						-					4
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	IEW13	dBm—				N N	<u> </u>	V V			1MA
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-60			l	<u> </u>		1	<u> </u>	<u> </u>	<u> </u>		1
											1
- 70											1
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Cer	nter 1	.93 GH	z		1.5	MHz/			Spar	15 MHz	-
Date:	26	5.APR.2	2001 9	1:25:24	_				,		
N i	CDM			. TO ID (DOT							
Notes:	CDMA Mark	Intermod U	pper Bandedg	e SUGB (DOW	(INLINK)						
	Marker	1 indicates	ingnest emissi	ion out of ban	u						
	warker	∠ muicates	mgnest emissi	ion mpana							

# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

PROJECT NO.: 1L0129RUS1

Page 2	of 4			UIANA	CIERIS		IVIA				
Job No.:	1L0129F	1		Date: 4/26	5/01						
Specification:	2.1		Tempe	rature(°C): 21							
Tested By:	Chinda P	oy	Relative H	umidity(%) 40							
E.U.T.:	PCS Rep	eater									
Configuration:	TX CDM	IA SIGNAL									
/ KAR			Marker	2 [T1]		RBW	30 K	Hz R	FAtt	30 dB	
Re Strategy	∋f L∨l			-40.	11 dBm	VBM	30 K	Hz M	ixer	–10 dBr	n
:	21.5 di	Зm		1.856928	86 GHz	SWT	З	s U	nit	dBr	n
20	21.5	a <del>B Offs</del>	e t				<b>T</b> 0	( = 1 ]	4.5	11 - 0 -	1 <b></b> _F
							•2		1 85692	9886 GHZ	
10							V1	[ ] ]	-39	000 0H2	
							_		1.84944	389 GHz	
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-60											
- 70											
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C	enter	1.85 GH	z		1.5	MHz/			Spar	15 MHz	
Date:	2	6.APR.2	2001 9	:22:09							
Notes:	CDMA	Intermod Up	oper Bandedg	e 50dB (UPLI	NK)						
	Marker	1 indicates l	nighest emissi	on out of band	1						
	Marker	2 indicates h	nighest emissi	on inband							

# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

PROJECT NO.: 1L0129RUS1

Data Plo	t INTE	ERMODU	JLATION	N CHARA	CTERIS	TICS CI	<b>MA</b>				
Page <u>3</u>	of 4	<u> </u>		D 1/2	C/01						
JOD INO.: Specification:	2 1051	<u> </u>	Tempe	Date: $\frac{4}{20}$	5/01						
Tested By:	Chinda P	ov	Relative H	umidity(%) 40							
E.U.T.:	PCS Rep	eater									
Configuration:	TX CDM	IA SIGNAL									
			Marker	2 [T1]		RBW	30 k	Hz R	FAtt	30 c	B
KY Re	f Lvl 1 E JE	•_	1	-40.	93 dBm	VBW	30 k	Hz M	ixer	-10 c	iBm IB-
~~~	1.5 86	om	1	.930390	1 M C	3	s u				
20	21.5 (	B OTTS	eτ			₹2	[〒1]	-40	.93 d	Bm	
10								1.93535	1579 G	Hz	
						× 1		-4L	.85 d	Bm	
n									1.32300		112
5							6	l			
- 10						<u>v</u>	J	L M.			
	4 <u>1 Ε</u> ₩1 3	dBm——				<u>کر ا</u>	- Y	<u> </u>	ป		1 MA
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Date:	2	6.APR.2	∠ 001 9	:27:35	1.0	111127			эраг	10 11	112
Notes:	CDMA	Intermod Ur	ner Bandedø	e 60dB (DOW	/NLINK)						
	Marker	· 1 indicates l	nighest emissi	on out of ban	d						
	Marker	2 indicates h	ighest emissi	on inband							

# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

PROJECT NO.: 1L0129RUS1

Test Plot	: INTE	ERMODU	JLATION	CHARA	CTERIS	TICS CD	MA				
Page <u>4</u>	of 4										
Job No.:	1L0129F	<u> </u>	Тания	Date: $\frac{4}{20}$	5/01						
Specification:	2.1051 Chinda E	Pov	Pelative H	midity(%) 40							
EUT	PCS Ren	eater	Relative III	mildity(70) 40							
Configuration:	TX CDM	IA SIGNAL									
<u>ki da</u>			Marker	2 [T1]		RBW	30 k	Hz Rf	- Att	30 dB	
Re 🖉	f ∟vl			-40.	13 dBm	VBW	30 k	Hz M	ixer	-10 dBm	ı
2	1.5 dl	∃m	1	.856057	'11 GHz	SWT	3	s Ur	ηİt	dBm	1
20	21.5	B Offs	et				▼2	[T1]	-40	.13 dBm	
10									1.85605	711 GHz	
10						$\checkmark_1$	[T1]	-39	.65 dBm	1	
									1.84944	389 GHz	
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Le	nter	1.85 GH	z		1.5	nHZ/			Spar	15 MHZ	
Date:	2	26.APR.2	2001 9	:20:30							
Notes:	CDMA	Intermod Ur	oper Bandedge	e 60dB (UPLI	NK)						
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# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

PROJECT NO.: 1L0129RUS1

Data Plot	CDM	A BANI	DEDGE								
Page 1 of	f <u>2</u>							0	Complete X		
Job No.:	1L0129	R		Date: 4/2	25/01			Pre	eliminary		
Specification:	2.1051		Temp	erature(°C): 22							
Tested By:	Chinda P	oy	Relative H	Iumidity(%) 30		•					
E.U.T.:	PCS Rep	eater									
Configuration:	TX CDM	IA SIGNAL									
Sample Number:	S01										
Location:	Lab 1				RBW:	Refer to plots					
Detector Type:	Peak				VBW:	Refer to plots					
51											
Test Equipm	ent Used										
Antenna:				Directi	onal Coupler:						
Pre-Amp:	-				Cable #1:	1082					
Filter:	-				Cable #2:						
Receiver:	1036				Cable #3:						
Attenuator #1	1477				Cable #4:						
Attenuator #2:	-				Mixer:						
Additional equip	ment used:										
Measurement Un	certainty:	+/-3.6 d	В								
$\sim$						RBW	30	кНz	RF Att	30 dB	
K Ref						VBW	30	kHz	Mixer	-10 dBr	n
21	.5 dB	m				SWT	8.5	ms	Unit	dBr	n
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Cen	ter 1	.99 GH	Z		300	KHZ/			S	pan 3 MHz	
Date:	25	5.APR.2	001 15	:49:48							
Notes:	CDMA	Upper Band	edge (DOW)	NLINK)							

#### EQUIPMENT: PCS Side-to-Side Repeater FCC ID:

PROJECT NO.: 1L0129RUS1

#### Data Plot CDMA BANDEDGE Page 2 of 2 1L0129R Job No.: Date: 4/25/01 Specification: 2.1 Temperature(°C): 22 Tested By: Chinda Poy Relative Humidity(%) 30 E.U.T.: PCS Repeater TX CDMA SIGNAL Configuration: RBL dE Ref Lvl 30 КНZ At1 30 -10 dBm νвы 30 kHz Mixer 21.5 dBm 8.5 ms SWT Unit dBm 20 21.5 dB Offse UBAI EDC 10 wh `w П -10 1 MAX 1 M A -20 ЕΧТ -30 mutter month mar and a second second -40 Mrm .٨. . N -50 -60 -70 Center 1.91 GHz 300 kHz/ Span 3 MHz 25.APR.2001 15:48:04 Date: CDMA Upper Bandedge (UPLINK) Notes:

# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

PROJECT NO.: 1L0129RUS1

Data Plot	CDMA	BAN	DEDGE								
Page 1 of	f <u>2</u>							Complete	e X		
Job No.:	1L0129R			Date: 4/2	5/01			Preliminar	y		
Specification:	2.1051		Temp	erature(°C): 21							
Tested By:	Chinda Poy		Relative H	Humidity(%) 40							
E.U.T.:	PCS Repeat	ter		<u> </u>							
Configuration:	TX FULL I	POWER									
Sample Number:	S01										
Location:	Lab 1				RBW:	Refer to plots					
Detector Type:	Peak	_			VBW:	Refer to plots					
Test Equipm	ent Used										
Antenna:				Directio	nal Coupler:						
Pre-Amp:		_			Cable #1:	1082					
Filter:		_			Cable #2:						
Receiver:	1036	_			Cable #3:						
Attenuator #1	1477	_			Cable #4:						
Attenuator #2:		_			Mixer:						
Additional equip	ment used:										
Measurement Un	certainty:	+/-3.6 dH	3								
1 AND						RBW	30 K	Hz Rf	- Att	30 dB	
Ref	Lv1					VBW	30 K	Hz M	ixer	-10 dBm	ı
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Cer	iter 1.	93 GH:	z		250	kHz/			Span	2.5 MHz	
Date:	26	. APR. 2	001 10	):29:14							
Notes:	CDMA L	ower Band	edge (DOWN	ILINK)							

# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

PROJECT NO.: 1L0129RUS1

ata Plot	t CDM	IA BAN	DEDGE								
Page <u>2</u> o No.: ecification: ted By: U.T.:	of 2 1L0129F 2.1 Chinda F PCS Rep	Poy Deater	Temp Relative H	Date: 4/2 erature(°C): 21 lumidity(%) 40	26/01						
Re 2	f Lvl 1.5 d	Bm				RBW VBW SWT	30 k 30 k 3	Hz F Hz f s l	RF Att Mixer Unit	30 dB -10 dBm dBm	1
20 10	21.5	dB Offs	e t						rulu y Junuh	~~~ d d bright	
0 - 10	(					1					1 M A
-20							Manhowwood	/			EXT
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-70	nter	1.85 G⊢	lz		250	kHz/			Span	2.5 MHz	ļ
ate: Notes:	2 CDMA	Lower Band	2001 10 ledge (UPLIN	):27:37 ( <b>K</b> )							

# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

PROJECT NO.: 1L0129RUS1

Data Plot	INTEF	RMODU	JLATIO	N CHARA	ACTER	ISTI	CS GS	M					
Page 1 of	f <u>4</u>								С	omplete	Х		
Job No.:	1L0129R			Date: 4/2	5/01				Prel	liminary			
Specification:	2.1051		Temp	erature(°C): 22									
Tested By:	Chinda Poy		Relative H	umidity(%) 30									
E.U.T.:	PCS Repeat	er				•							
Configuration:	TX GSM S	IGNAL											
Sample Number:	S01												
Location:	Lab 1				RBW:	Refer to	plots						
Detector Type:	Peak	-			VBW:	Refer to	plots						
Test Equipm	ent Used												
Antenna:				Directio	onal Coupler:								
Pre-Amp:		-			Cable #1:	10	82						
Filter:		-			Cable #2:								
Receiver:	1036	-			Cable #3:								
Attenuator #1	1477	-			Cable #4:								
Attenuator #2:		-			Mixer:								
Additional equip	ment used:												
Measurement Un	certainty:	+/-3.6 dB	3										
/side							RBW	30	кНz	RF	Att	30 dB	
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21	.5 dBr	ı					SWT	140	ms	Un	it	dB	m
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Cer	nter 1.	.9877 (	GHz		5	MHz,	/				Spar	1 50 MH;	z
Date:	25	.APR.2	001 14	4:48:46									
Notes:	GSM Inte	rmod Uppe	er Bandedge	50dB (DOWN	NLINK)								
	5 CARRI	ERS	<u> </u>										
	-												

# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

PROJECT NO.: 1L0129RUS1

#### Test Data --- Spurious Emissions at Antenna Terminals Data Plot INTERMODULATION CHARACTERISTICS GSM Page <u>2</u> of <u>4</u> Job No.: 1L0129R Date: 4/25/01 Specification: 2.1 Temperature(°C): 22 Tested By: Chinda Poy Relative Humidity(%) 30 E.U.T.: PCS Repeater Configuration: TX GSM SIGNAL 30 kHz RF Att 30 dB RBW Ref Lvl νвы 30 kHz Mixer -10 dBm 21.5 dBm SWT 140 ms dBm Unit 20 21.5 dB Offs 10 С - 1 0 1<sub>С</sub>У<sub>1</sub>IЕ µ<sub>1 Э</sub> 1 MA dBm -20 Е×Т -30 -40 \* MUUUUUU wyley بر محاسباساته mulur under men أمامه الاند Muu L. ...... -50 -60 - 70 Center 1.8976855 GHz 5 MHz/ Span 50 MHz Date: 25.APR.2001 14:43:37 GSM Intermod Upper Bandedge 50dB (UPLINK) Notes: **5 CARRIERS**

# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

PROJECT NO.: 1L0129RUS1

Data Plo	t INT	ERMODU	JLATION	N CHARA	ACTERI	ST	ICS GS	M						
Page 3	of 4													
Job No.:	1L0129	R		Date: 4/25	5/01									
Specification:	2.1051		Tempe	rature(°C): 22										
Tested By:	Chinda l	Poy	Relative H	umidity(%) 30										
E.U.T.:	PCS Re	peater												
Configuration:	TX GSN	M SIGNAL												
<u> Kana</u>							RBW	30	ĸ	Hz RF	- Att	30	dB	
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Ce	nter	1.9877	ЭНz		5	MH:	z/				Spar	50	MHz	
Date:	2	25.APR.2	001 14	:47:18										
Notes:	GSM I	ntermod Upp	er Bandedøe (	60dB (DOWN	LINK)									
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# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

PROJECT NO.: 1L0129RUS1

Test P	<u>lot:</u> INT	ERMOD	ULATION	N CHARA	CTERIS	TICS GS	M					
Page	<u>4</u> of <u>4</u>											
Job No.:	1L0129	R		Date: 4/2;	5/01							
Specification	n: 2.1051		Tempe	erature(°C): 22								
Tested By:	Chinda	Poy	Relative H	umidity(%) 30								
E.U.T.:	PCS Re	peater										
Configuratio	on: TX GSN	M SIGNAL										
						RBW	30	kHz	RF M	Att	30 dB	
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Notes	5 CAR	ntermoa Opp RIERS	er Bandedge	OUUB (UPLIN	K)							
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# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

### PROJECT NO.: 1L0129RUS1

Data Plot	INTER	MODU	JLATIO	N CHARA	ACTER	ISTICS	GS	M				
Page 1 of	f <u>4</u>								Com	olete X		
Job No.:	1L0129R			Date: 4/2	5/01				Prelimi	nary	_	
Specification:	2.1051		Tempe	erature(°C): 21						-	_	
Tested By:	Chinda Poy		Relative H	umidity(%) 40								
E.U.T.:	PCS Repeate	er	_									
Configuration:	TX GSM SIG	GNAL										
Sample Number:	S01						_					
Location:	Lab 1	_			RBW:	Refer to plots	3					
Detector Type:	Peak	-			VBW:	Refer to plots	3					
Test Equipm	ent Used											
Antenna:		-		Directio	nal Coupler:							
Pre-Amp:		_			Cable #1:	1082						
Filter:					Cable #2:							
Receiver:	1036	-			Cable #3:		_					
Attenuator #1	1477	-			Cable #4:							
Attenuator #2:					Mixer:							
Additional equip	ment used:											
Measurement Un	certainty:	+/-3.6 dI	3									
						RE	3W	30 k	Hz	RF Att	30 dE	3
Ref	∟vl					VE	3W	30 k	Hz	Mixer	-10 dE	3 m
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Date:	26.	APR.2	- 10	:12:20								
Notes:	GSM Inter	mod Low	er Bandedge	50dB (DOW)	NLINK)							
	5 CARRIE	KS										

# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

PROJECT NO.: 1L0129RUS1

Data Plo	t INTI	ERMODU	JLATION	I CHARA	CTERIS	TICS GS	M				
Page <u>2</u>	of 4 11.01291	2		Date: 4/25	/01						
Specification:	2.1	<u> </u>	Tempe	rature(°C): 21	/01						
Tested By:	Chinda l	Poy	Relative Hu	umidity(%) 40							
E.U.T.:	PCS Rep	beater									
Configuration:	TX GSN	1 SIGNAL									
						R B I J	30 K	Hz RE	=	30 dB	
Re Re	f∟vl					VBW	30 K	Hz M	ixer	-10 dBr	n
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Ce	nter	1.85 GH	Z		5 M	Hz/			Spar	50 MHz	-
Date:	ź	26.APR.2	001 10	:10:14							
Notes:	GSM I	ntermod Uppe	er Bandedge f	50dB (UPLIN	<b>K</b> )						
	5 CAR	RIERS	Junucuge								
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# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

PROJECT NO.: 1L0129RUS1

Data Plo	ot INTI	ERMODU	JLATION	N CHARA	ACTERIS	STICS G	<u>SM</u>				
Page <u>3</u>	of 4	<u> </u>		Data: 4/2	5/01						
Specification:	2.1051	<u> </u>	Tempe	rature(°C): 21	3/01						
Tested By:	Chinda I	Poy	Relative H	umidity(%) 40							
E.U.T.:	PCS Rep	eater									
Configuration:	TX GSM	I SIGNAL									
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-40											
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Le	nter	1.93 GH:	Z		5 1	Hz/			Spar	л 50 МН2	2
Date:	2	6.APR.2	001 10	:13:34							
Notes:	GSM I	ntermod Low	er Bandedge	60dB (DOW)	NLINK)						
	5 CAR	RIERS									

# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

PROJECT NO.: 1L0129RUS1

Test Plot	: INTE	ERMOD	JLATION	N CHARA	ACTERIS	STICS	GS	<u>SM</u>				
Page <u>4</u>	of 4											
Job No.:	1L0129F	2	_	Date: 4/2	5/01							
Specification:	2.1051		Tempe	rature(°C): 21								
Tested By:	Chinda F	oy	Relative H	umidity(%) 40								
E.U.I.: Configuration:	PCS Rep	ELCNAL					_					
configuration.	17 031	I SIGNAL					_					
Re 2	f Lvl 15 de	3 m				RB VB SU	W W	30 k 30 k 3	Hz RF Hz M	- Att ixer	30 dB -10 dBr	1
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Date:	2	6.APR.2	001 10	:08:38								
Notes:	GSM Iı	ntermod Upp	er Bandedge	60dB (UPLIN	VK)							
	5 CARI	RIERS		(								

# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

PROJECT NO.: 1L0129RUS1

Page $\bot$ of $2$ Complete XJob No.:IL0129RDate: 4/25/01PreliminarySpecification:2.1051Temperature(°C): 22Tested By:Chinda PoyRelative Humidity(%) 30E.U.T.:PCS RepeaterConfiguration:TX GSM SIGNALSample Number:S01Location:Lab 1Coetion:Lab 1Refer to plotsDetector Type:PeakVBW:Refer to plotsPrest Equipment UsedAntenna:Directional Coupler:Filter:Cable #1:1036Cable #2:Receiver:1036Attenuator #11477Additional equipment used:	
Job No.:       IL0129R       Date: 4/25/01       Preliminary         Specification:       2.1051       Temperature(°C): 22         Tested By:       Chinda Poy       Relative Humidity(%) 30         E.U.T.:       PCS Repeater         Configuration:       TX GSM SIGNAL         Sample Number:       S01         Location:       Lab 1         Refer to plots         Detector Type:       Peak         VBW:       Refer to plots         Detector Type:       Peak         VBW:       Refer to plots         Filter:       Cable #1:         Test       Cable #1:         Internan:       Directional Coupler:         Filter:       Cable #1:         Receiver:       1036         Attenuator #1       1477         Additional equipment used:       Mixer:	
Specification:       2.1051       Temperature(°C): 22         Tested By:       Chinda Poy       Relative Humidity(%) 30         E.U.T.:       PCS Repeater         Configuration:       TX GSM SIGNAL         Sample Number:       S01         Location:       Lab 1         Refer to plots         Detector Type:       Peak         VBW:       Refer to plots         Test Equipment Used         Antenna:       Directional Coupler:         Pre-Amp:       Cable #1:         Filter:       Cable #3:         Attenuator #1       1477         Attenuator #2:       Mixer:         Additional equipment used:       Mixer:	
Tested By: Chinda Poy Relative Humidity(%) 30 E.U.T.: PCS Repeater Configuration: TX GSM SIGNAL Sample Number: S01 Location: Lab 1 RBW: Refer to plots Detector Type: Peak VBW: Refer to plots Test Equipment Used Antenna: Directional Coupler: Pre-Amp: Cable #1: 1082 Filter: Cable #2: Receiver: 1036 Cable #3: Attenuator #1 1477 Cable #4: Attenuator #1 1477 Cable #4:	
E.U.T.:       PCS Repeater         Configuration:       TX GSM SIGNAL         Sample Number:       S01         Location:       Lab 1         Refer to plots         Detector Type:       Peak         VBW:       Refer to plots         Test Equipment Used         Antenna:       Directional Coupler:         Pre-Amp:       Cable #1:         Filter:       Cable #2:         Receiver:       1036         Attenuator #1       1477         Additional equipment used:       Mixer:	
Configuration:       TX GSM SIGNAL         Sample Number:       S01         Location:       Lab 1       RBW: Refer to plots         Detector Type:       Peak       VBW: Refer to plots         Test Equipment Used       Directional Coupler:	
Sample Number:       S01         Location:       Lab 1       RBW: Refer to plots         Detector Type:       Peak       VBW: Refer to plots         Test Equipment Used       Directional Coupler:	
Location:     Lab 1     RBW: Refer to plots       Detector Type:     Peak     VBW: Refer to plots       Test Equipment Used         Antenna:     Directional Coupler:        Pre-Amp:     Cable #1:     1082       Filter:     Cable #2:        Receiver:     1036     Cable #3:       Attenuator #1     1477     Cable #4:       Additional equipment used:     Mixer:	
Detector Type:       Peak       VBW:       Refer to plots         Test Equipment Used	
Test Equipment Used         Antenna:       Directional Coupler:         Pre-Amp:       Cable #1:       1082         Filter:       Cable #2:       Cable #3:         Receiver:       1036       Cable #3:         Attenuator #1       1477       Cable #4:         Attenuator #2:       Mixer:       Mixer:	
Antenna:     Directional Coupler:       Pre-Amp:     Cable #1:       Filter:     Cable #2:       Receiver:     1036       Attenuator #1     1477       Attenuator #2:     Mixer:	
Pre-Amp:       Cable #1: 1082         Filter:       Cable #2:         Receiver:       1036         Attenuator #1       1477         Cable #4:	
Filter:     Cable #2:       Receiver:     1036       Attenuator #1     1477       Cable #4:     Cable #4:       Attenuator #2:     Mixer:       Additional equipment used:	
Receiver:     1036     Cable #3:       Attenuator #1     1477     Cable #4:       Attenuator #2:     Mixer:       Additional equipment used:	
Attenuator #1     1477     Cable #4:       Attenuator #2:     Mixer:       Additional equipment used:	
Attenuator #2: Mixer:	
Additional equipment used:	
Measurement Uncertainty: +/-3.6 dB	
$\pi$ - 5.5 cm	
Marker 1 [T1] RBW 30 kHz RF Att 30 dB	
Ref Lyl 3.36 dBm VBW 30 kHz Mixer -10 dBm	
21.5 dBm 1.98970000 GHz SWI 5 ms Unit dBm	
	ì
20 21.5 PB Offset UBANDEDG	
-10	
	1MA
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	EXT
-30	
-50 -50	
-70	
	l
Center 1.99 GHz 60 kHz/ Span 600 kHz	
Date. 2J.HFR.2001 1J.45.14	
Notes:         GSM Upper Bandedge (DOWNLINK)	

# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

PROJECT NO.: 1L0129RUS1

ta Plot	GSN	I BAND	EDGE									
Page <u>2</u> o	of 2											
No.:	1L0129	R	т	Dat	e: 4/25/0	1						
ification:	2.1 Chinda	Derr		emperature(°C	): 22							
еа ву: Г	DCG D	roy	Relati	ve Humidity(%	5) 30							
I.:	TY CEN											
igui ation.	17 05	I SIGNAL										
>			Marke	er 1 [T	1]		RBW	30 k	Hz F	RF Att	30 dB	
🖌 Ref	L∨1				з.з	6 dBm	VBW	30 k	۲ EHz	1ixer	-10 dB	m
21	.5 dl	Зm		1.989	7000	O GHz	SWT	5 m	ns l	Jnit	dB	m
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Cer	nter	1.99 G	Ηz			60 H	≺Hz∕			Span	600 kH	z
te:	2	5.APR.	2001	15:43:	14							
Notes:	GSM I	Inner Band	edge (UPU	INK)								
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# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

PROJECT NO.: 1L0129RUS1

Data Plot	GSM BA	ANDE	DGE								
Page 1 of	f <u>2</u>							Complet	e X		
Job No.:	1L0129R			Date: 4/2	6/01			Preliminar	v		
Specification:	2.1051		Temr	erature(°C): 21							
Tested By:	Chinda Pov		Relative H	Jumidity(%) 40							
E.U.T.:	PCS Repeater		_								
Configuration:	TX GSM SIG	NAL									
Sample Number:	501	INAL									
Location:	Lab 1				RBW.	Refer to plots					
Detector Type:	Peak				VBW-	Refer to plots					
Detector Type.	1 Cak				v D W.	Refer to piots					
Test Equipm	ent Used										
Antenna:				Directio	onal Coupler:						
Pre-Amp:					Cable #1:	1082					
Filter:					Cable #2:						
Receiver:	1036				Cable #3:						
Attenuator #1	1477				Cable #4:						
Attenuator #2:					Mixer:						
Additional equip	ment used:										
Measurement Un	certainty:	+/-3.6 dB									
							2.0 1				
	1 1					RBW	30 8	HZ RI	- Att	3U 8B	
						VBW	30 8	HZ 11	ixer		n -
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Date:	20.1	-PR.21		0.22:30							
Notes:	GSM Lower	r Banded	ge (DOWNI	LINK)							

# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

PROJECT NO.: 1L0129RUS1

Data Plot	GSM BAND	EDGE								
Page 2 of	f 2		D 1/2	c (01						
JOD INO.: Specification:	2 1	Temp	Date: $\frac{4}{2}$	0/01						
Tested By:	Chinda Poy	Relative H	umidity(%) 40							
E.U.T.:	PCS Repeater		uniuny(///)							
Configuration:	TX GSM SIGNAL									
-										
1 A					RBW	30 k	Hz R	FAtt	30 dB	
Ref	Lvl				VBW	30 k	Hz M	ixer	-10 dBr	n
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Cer	ter 1.85 GH	⊣z		50 I	≺Hz∕			Span	500 kHz	
Date	26 APR	2001 10	·24·30							
Date.	20.868.	2001 10	. 2 4 . 20							
Notes:	GSM Lower Band	edge (UPLINK	L)							

# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

### PROJECT NO.: 1L0129RUS1

Data Plot	INTERMO	ULATION	N CHARA	CTER	ISTICS TI	DMA				
Page 1 of	f <u>4</u>						Complet	te X		
Job No.:	1L0129R		Date: 4/23	8/01			Prelimina	.y		
Specification:	2.1051	Tempe	rature(°C): 21							
Tested By:	Chinda Poy	Relative H	umidity(%) 64							
E.U.T.:	PCS Repeater									
Configuration:	TX TDMA SIGNAL									
Sample Number:	S01									
Location:	Lab 1			RBW:	Refer to plots					
Detector Type:	Peak			VBW:	Refer to plots					
Test Equipm	ent Used									
Antenna:			Direction	nal Coupler:						
Pre-Amp:				Cable #1:	1082					
Filter:				Cable #2:						
Receiver:	1036			Cable #3:						
Attenuator #1	1477			Cable #4:						
Attenuator #2:				Mixer:						
Additional equip	ment used:									
Measurement Un	certainty: +/-3.6	dB								
<i>∕</i> s≩∧		Marker	2 [T1]		RBW	30 H	kHz F	RF Att	30 dB	
Ref	Lvl		-35.	08 dBr	n VBW	30 H	≺Hz Ւ	1ixer	-10 dBm	I I
21	.5 dBm	1	.985746	49 GHz	z SWT	42 r	ns l	Jnit	dBm	I
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Date:	25.APR.	. <u> </u>	:32:51					550		
Notos	TDMA Intermed	Inner Bondede	o 50dB (DOW							
Notes.	Marker 1 indicate	pper Danueug	on out of bory							
	Marker 2 indicate	highest emissi	on julion Dalle							
	marker 2 mulcate	s ingliest emissi	on moallu							

# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

PROJECT NO.: 1L0129RUS1

Data 1	Plot	INT	ERMOD	ULATIO	N CHAR	ACTERIS	STICS TD	<u>MA</u>				
Pag	e <u>2</u> of	4										
Job No.:		1L0129	R		Date: 4/2	3/01						
Specificati	ion:	2.1		Temp	erature(°C): 21							
Tested By:	:	Chinda	Poy	Relative F	Iumidity(%) 64							
E.U.T.:		PCS Re	peater									
Configurat	tion:	TX TD	MA SIGNAL									
/K				Marker	2 [T1]		RBW	30 k	Hz F	RF Att	30 dB	
X.	Ref Lvl				-31	.16 dBm	VBW	30 k	Hz N	1ixer	-10 dBr	n
	21	.5 d	Bm		1.89107	715 GHz	SWT	42 m	is l	Jnit	dBr	n
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								▼2	[[]1]	-31	.16 dBn	n 💻
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	Len	ter	1.895 G	HZ		1.5	MHZ/			Spar	15 MHz	2
Date:	:	ź	25.APR.2	2001 15	5:23:46							
Note	s:	TDMA	A Intermod U	pper Banded	ge 50dB (UPL	INK)						
		Marke	er 1 indicates	highest emiss	ion out of ban	d						
		Marke	er 2 indicates	highest emiss	ion inband							

# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

PROJECT NO.: 1L0129RUS1

Page 3 of 4       Date: 4/23/01         Job No:       110129R       Date: 4/23/01         Specification:       21051       Temperature(*C): 21         Tested By:       Chinda Poy       Relative Humidity(%) 64         EUT:       PCS Repeater         Configuration:       TX TDMA SIGNAL         Image 3 of 4       -33.55 dBm       VBM 30 kHz       MF et 1         20       21.5 dB OTTSet       -33.55 dBm       VBM 30 kHz       Mixer       -10 dBm         21.5 dB OTTSet       -33.55 dBm       VBM 30 kHz       Mixer       -10 dBm         20       21.5 dB OTTSet       -10 dBm       1.99025551 GHz       SWT 42 ms       Unit       dBm         -10       CX1LEH13 dBm       -34.89 dBm       1.98574649 GHz       1.98574649 GHz       IMA         -20       -30       <	Data Plot INTERMO	Data Plot INTERMODULATION CHARACTERISTICS TDMA												
Job No:       110129R       Date: 2/2301         Specification:       2.1051       Temperature(*0): 21         Tested By:       Chinda Poy       Relative Humidity(%): 64         E.U.T.:       PCS Repeater         Configuration:       TX TDMA SIGNAL         Image: TX TDMA SIGNAL       -33,55 dBm       VBM       30 kHz       RF Att       30 dB         21.5 dBm       1.99025551 GHz       SWT       42 ms       Unit       dBm         20       21.5 dBm       1.99025551 GHz       V1 [T1]       -33,55 dBm       V8H       30 kHz       RF Att       30 dB         10       V1       V1 [T1]       -33,55 dBm       V2 [T1]       -33,55 dBm       Image: V2 [T1]       -33,55 dBm         10       V2 [T1]       -33,55 dBm       V2 [T1]       -33,55 dBm       Image: V2 [T1]       -34,89 dBm         -10       V1 [T1]       -33,55 dBm       V2 [T1]       -34,89 dBm       Image: V2 [T1]       Image: V2 [T1] <td>Page <u>3</u> of <u>4</u></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	Page <u>3</u> of <u>4</u>													
Specification:       2.01       Temperature(-C): 21         Tested By:       Chinda Poy       Relative Humidity(%) 64         EUT.:       PCS Repeater         Configuration:       TX TDMA SIGNAL         Image: TX TDMA SIGNAL       -33.55 dBm       VBW       30 kHz       NF Att       30 dB         21.5       B       UTTSet       -33.55 dBm       VBW       30 kHz       Mixer       -10 dBm         20       21.5       B       UTTSet       V1       T11       -33.55 dBm       1.99025551 GHz         10       V2       V1       1.99025551 GHz       V2       1.99025551 GHz         10       V2       V1       1.99025551 GHz       -34.89 dBm       1.99025551 GHz         -10       10       V2       V1       1.98574649 GHz       -34.89 dBm         -20       2       0       0       0       0       0         -30       2       0       0       0       0       0       0         -30       2       0       0       0       0       0       0       0         -30       2       0       0       0       0       0       0       0       0       0	Job No.: <u>1L0129R</u>	Date: 4/23/01												
Listed by:	Specification: 2.1051	Palative Humidity(%) 64												
TXTOMASIGNAL         Marker 1 [T1]       RBH       30 KHz       RF Att 30 dB         Marker 1 [T1]       RBH       30 KHz       RF Att 30 dB         VBW 30 KHz       Mixer -10 dBm         21.5 dB UTTSET       V1 [T1]       -33.55 dBm         V2 [T1]       -33.55 dBm         V2 [T1]       -33.55 dBm         V2 [T1]       -33.55 dBm         V2 [T1]       -33.55 dBm         10         V2 [T1]       -33.55 dBm         V2 [T1]       -34.89 dBm         10         IMA         O         V2 [T1]       -34.89 dBm         10         IMA         20         O         O         O         O         O         O         O         O         O	FUT: PCS Percenter	Relative Humidity(%) 04												
Marker 1 [T1]       RBW -33.55 dBm       30 kHz       RF Att       30 dB Mixer         21.5 dBm       1.99025551 GHz       SWT       42 ms       Unit       dBm         20       21.5 dB       UTISET       1.99025551 GHz       SWT       42 ms       Unit       dBm         10       1       111       -33.55 dBm       1.99025551 GHz       SWT       42 ms       Unit       dBm         10       1       111       -33.55 dBm       1.99025551 GHz       SWT       42 ms       Unit       dBm         10       1       1.99025551 GHz       V2 (T11)       -33.55 dBm       1.99025651 GHz       IMA         -10       10       1       1.98574649 GHz       1.98574649 GHz       IMA         -20       2       2       4       4       4       4       4       Ext         -30       2       4       4       4       4       4       4       4       4       4       4       4       5 <td< td=""><td>Configuration: TX TDMA SIGNAI</td><td></td><td></td><td></td><td></td><td></td><td></td></td<>	Configuration: TX TDMA SIGNAI													
Marker 1 [T1]       RBW       30 kHz       RF Att       30 dB         21.5 dBm       1.99025551 GHz       SWT       42 ms       Unit       dBm         20       21.5 dBm       1.99025551 GHz       SWT       42 ms       Unit       dBm         10       10       11       -33.55 dBm       VBW       30 kHz       Mixer       -10 dBm         10       21.5 dB       UTTSET       11       [T1]       -33.55 dBm       1.99025551 GHz       SWT       42 ms       Unit       dBm         10       21.9025551 GHz       21.9025551 GHz       1.99025551 GHz	<u></u>													
Ref Lv1       -33.55 dBm       VBW       30 kHz       Mixer       -10 dBm         21.5 dBm       1.99025551 GHz       SWT       42 ms       Unit       dBm         20       21.5 dB       Uffset       V1       [T1]       -33.55 dBm       VBW       30 kHz       Mixer       -10 dBm         20       21.5 dB       Uffset       V1       [T1]       -33.55 dBm       V2       [T1]       -34.89 dBm         10       V2       V1       V1       1.98574649 GHz       V2       Ima       Ima         -10       IMA       V2       [T1]       -34.89 dBm       Ima       Ima         -20       V2       Ima       V2       Ima       Ima       Ima         -30       2       V1       V1       V1       Ima       Ext         -40       2       V1       V1       V1       V1       V1       V1         -50       2       V1       V1       V1       V1       V1       V1       V1         -60       V1       V1       V1       V1       V1       V1       V1       V1		Marker 1 [T1]	RBW	30 kHz	RF Att	30 dB								
21.5 dBm       1.99025551 GHz       SWT       42 ms       Unit       dBm         20       21.5 dB UTTSet       -33.55 dBm       1.99025551 GHz       1.99025551 GHz       -33.55 dBm         10       -34.89 dBm       -24.89 dBm       -24.89 dBm       -24.89 dBm       1.98574649 GHz       1.98574649 GHz         -10       10/41 EH/13 dBm       -20       -24.49	Ref Lvl	-33.55 dBm	VBW	30 kHz	Mixer	-10 dBm								
20       21.5 dB UTTSet       1       IT1       -33.55 dBm         10       1.9902551 GHz       1.9902551 GHz       1.9902551 GHz         10       V2       IT1       -34.89 dBm         -10       IV1EH13 dBm       1.98574649 GHz       1.98574649 GHz         -10       IV1EH13 dBm       IMA         -20       2       1       IMA         -30       2       1       IMA         -40       2       1       IMA         -50       2       1       IMA         -60       1       1       1	21.5 dBm	1.99025551 GHz	SWT	42 ms	Unit	dBm								
10     -33.55 dBm       10     1.9902551 GHz       11     -34.89 dBm       1.98574649 GHz       10     1.98574649 GHz       11     1.98574649 GHz       12     1       12     1       13     1       14     1       15     1       14     1       15     1       16     1       16     1       17     1       18     1       19     1       19     1       19     1       19     1       19     1       19     1       19     1	20 21.5 dB Off	set i	1 1											
10       1.990234.89 dBm         -10       -34.89 dBm         10       1.98574649 GHz         10				•1 [[1]	-33.	.55 dBm								
-10 -10 -20 -30 -40 -60 -60 -60 -60 -10 -10 -10 -10 -10 -10 -10 -1	10		╉───┼		-34	89 dBm								
-10 -10 -10 -10 -20 -30 -40 -50 -60 -60		,  ,			1.985746	649 GHz								
-10 10 10 10 10 10 10 10 10 10	0													
-10 10 10 10 10 10 10 10 10 10														
-20     -20 <td>- 10</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	- 10													
-20 -30 -40 -50 -60	-10Y1 EH13 dBm-		++				1 MA							
-20 -30 -40 -50 -60 -60 -20 -20 -20 -20 -20 -20 -20 -2	25													
-30 $-40$ $-50$ $-60$ $-60$	-20													
-30 -40 -50 -60							EXI							
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-60	-50	an and and an and allowing	an management		- man sound	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~								
-60														
	-60		4 +											
-70	- 70													
Center 1.99 GHz 1.5 MHz/ Span 15 MHz	Center 1.99 C	Hz 1.5	MHz/		Span	15 MHz								
Date: 25.APR.2001 15:29:44	Date: 25.APR	.2001 15:29:44												
Notes: TDMA Intermod Upper Bandedge 60dB (DOWNLINK)	Notes: TDMA Intermod	Upper Bandedge 60dB (DOWNLINK)												
Marker 1 indicates highest emission out of band	Marker 1 indicat	es highest emission out of band												
Marker 2 indicates highest emission inband	Marker 2 indicat	s highest emission inband												

# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

PROJECT NO.: 1L0129RUS1

Test Plo	ot: INTE	RMODI	JLATIO	N CHARA	ACTERIS	STICS TI	DMA				
Page <u>4</u>	of 4	_									
Job No.:	1L0129R	_		Date: 4/2	3/01						
Specification:	2.1051		Tempe	erature(°C): 21							
Tested By:	Chinda Po	ý	Relative Humidity(%) 64								
E.U.I.: Configuration:	TV TDMA	SIGNAL									
coninguration.	IX IDMA	SIGNAL									
$\wedge$			Marker	2 [T1]		RBW	ЗП К	Hz R	RE Att	30 dB	
Re Re	ef∟vl			-31.	47 dBm	VBW	30 k	Hz M	1ixer	-10 dB	m
2	1.5 dBn	ı	1	.891077	15 GHz	SWT	42 m	is L	J⊓it	dB	m
20	21.5 00	UTTS	e t							-	<b>–_</b> F
							▼2	[⊤1]	-3	1.47 dB 7715 GH	m 💻
10							v1	[T1]	-3	1.87 dB	m
				1	1				1.89555	5611 GH:	z
0									+		-
- 10				┝─┣							
	, הואדיני	3Bm ——									<b></b> ``` <b>_</b>
-20											_
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- 30			2			1					
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-40				<u> </u>							_
l .											
-50	<u>munipp</u>	uhullin	Vin limit	بلا سسس	ww www	www.	Multulury	mound	<u>ynn wr</u>	<u>harren</u>	<u>~</u>
-60											_
- 70											
-10											
Ce	enter 1	.895 GI	Ηz		1.5	MHz/			Spar	n 15 MH:	z
Date:	25	. APR. 2	001 15	:26:50							
Notes:	TDMA II	ntermod Uj	oper Bandedg	e 60dB (UPL	INK)						
	Marker 1	indicates	highest emissi	on out of ban	d						
	Marker 2	indicates	highest emissi	on inband							

# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

### PROJECT NO.: 1L0129RUS1

Data Plot	INTER	MODU	JLATIO	N CHARA	ACTER	ISTICS T	DMA				
Page 1 of	f <u>4</u>							Complet	e X		
Job No.:	1L0129R			Date: 4/2	6/01			Preliminar	у		
Specification:	2.1051		Temp	erature(°C): 21							
Tested By:	Chinda Poy		Relative H	Humidity(%) 40							
E.U.T.:	PCS Repeate	er	_								
Configuration:	TX TDMA S	SIGNAL									
Sample Number:	S01										
Location:	Lab 1				RBW:	Refer to plots					
Detector Type:	Peak	-			VBW:	Refer to plots					
Test Equipm	ent Used										
Antenna:				Directio	nal Coupler:						
Pre-Amp:					Cable #1:	1082					
Filter:					Cable #2:						
Receiver:	1036	-			Cable #3:						
Attenuator #1	1477				Cable #4:						
Attenuator #2:					Mixer:						
Additional equip	ment used:										
Measurement Un	certainty:	+/-3.6 dI	3								
			Marker	2 [T1]		RBW	30 H	Hz RF	- Att	30 dB	
Ref	Lvl			-35.	60 dBm	n VBW	30 H	Hz M	ixer	-10 dBm	n
21	.5 dBm			1.934163	33 GHz	: SWT	З	s Ur	⊐it	dBr	ı
20				1		-		1	1		1
20 2		UTTS	eτ				▼2	[[]]]	-35	.60 dBm	
									1.93416	333 GHz	
10							V1	[[]]]	-35	.07 dBm	
						1 1	1		1.92965	431 GHz	
0											
										'	
- 10	IEW 3 d	IBm									1MA
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-20							<u>↓                                    </u>			ļ'	
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-60											
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- 70										ļ'	4
											J
Cer	nter 1.	93 GH:	Z		1.5	MHz/			Span	15 MHz	
Date:	26.	APR.2	001 9	9:44:48							
Notes:	TDMA Int	ermod Lo	wer Banded	ge 60dB (DOV	VNLINK)						
	Marker 1 i	indicates l	nighest emiss	ion out of ban	d						
	Marker 2 i	indicates l	nighest emiss	ion inband							
1											

# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

PROJECT NO.: 1L0129RUS1

Data Plot INTERMODULATION CHARACTERISTICS TDMA											
Page <u>2</u> c	f <u>4</u>										
Job No.:	1L0129R		Date: 4/26	5/01							
Specification:	2.1	Temperat	ure(°C): 21								
Tested By:	Chinda Poy	Relative Hum	idity(%) 40								
E.U.T.:	PCS Repeater										
Configuration:	TX TDMA SIGNAL										
		Marker 1	[[1]]	70 - 0	RBM	3U K	HZ RI	- Att	.3U dB		
		1	-29.	78 abm	VBW	зU к С	HZ N	ixer _:+			
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20-2	1.5 08 0ff	set				▼1	ГТ 1 I	_ 29	78 dBm		
						1		1 84914	329 GHZ		
10						2		-29	.95 dBm		
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-20											
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-6Л											
- 70											
				1 5	MHZZ	1		- Snar	15 MHz		
				1.0				Spar			
vate:	26 APR.	2001 9:5	58:46								
Notes:	TDMA Intermod	Lower Bandedge (	60dB (UPLI	INK)							
	Marker 1 indicate	s highest emission	out of band	d							
	Marker 2 indicate	s highest emission	inband								

# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

PROJECT NO.: 1L0129RUS1

Data Plo	Data Plot INTERMODULATION CHARACTERISTICS TDMA											
Page 3	of <u>4</u>											
Job No.:	1L01291	2	π	Date: $\frac{4}{2}$	6/01							
Specification:	2.1051		Tempe	rature(°C): $21$								
Tested By:	Chinda I	Poy	Relative Hu	$1 \text{ midity}(\%) = \frac{40}{10}$								
E.U.I.: Configuration:	TV TDA	A SICNAL										
Configuration.		A SIGNAL										
			Marker	1 [T1]		RBW	30 k	Hz F	RF Att	30 dB		
Re	f Lvl			-35.	64 dBm	VBW	30 k	Hz I	Mixer	-10 dB	m	
2	1.5 d	Bm	1	.929654	131 GHz	SWT	З	s l	Jnit	dB	m	
20	21.5	dB Offs	e t				_				<b>—</b> F	
							•1	[[]]]	-35	5.64 dBr	m 💻	
10							V2	[TT1]	1.92965	1 11 dB	z	
							2		1 93416	4.11 CU	7	
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1.5							ļ					
	У₁ІЕЫ <sub>1Э</sub>	dBm									1 M A	
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					$1$ $\frac{1}{\mathbf{Y}}$			<u> </u>	,			
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-50												
-60											-	
- 70											-	
			_		1 5	MU			 	- 15 MU		
Le	anter <sup>a</sup>	1.33 GH	~		1.5	1172/			spar	1 13 MH:	۷	
Date:	2	26.APR.2	2001 9	:47:40								
Notes:	TDMA	Intermod La	wer Bandedg	e 50dB (DOV	VNLINK)							
	Marke	r 1 indicates l	nighest emissi	on out of ban	d							
	Marke	r 2 indicates l	nighest emissi	on inband								

# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

PROJECT NO.: 1L0129RUS1

Test Plot:	INTE	RMODU	JLATION	N CHARA	ACTERIS	STICS TI	DMA				
Page <u>4</u> of	4										
Job No.:	1L0129R		π	Date: 4/2	6/01						
Specification:	2.1051		I empe	rature( $^{\circ}$ C): 21							
Tested By:	DCS Dame	oy	Relative H	$1 \text{ midity}(\%) \frac{40}{10}$							
Configuration:	TY TDM										
comgutation	IN IDM	I DIGITIL									
$\wedge$			Marker	1 [T1]		RBW	30	кНz	RF Att	30 dB	
Ref	Lv1			-29.	40 dBm	VBW	30	kHz	Mixer	-10 dBr	n
21	.5 dB	m	1	.849143	329 GHz	SWT	з	s	Unit	dBr	n
20	1.5 0	B Offse	e t								٦F
							•	1 [[]1]	-29	9.40 dBm	
10									1.8491	4329 GHz	
								2   [   ] ]	1 8536	6.71 000 5230 647	
0									1.0000	3230 012	
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00											
6.0											
-60											1
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Cer	iter 1	.85 GH:	z		1.5	MHz/			Spar	n 15 MHz	
	21	5 APR 2	001 9	·54·20							
Dale.	20	5. HEN. 2	551 3								
Notes:	TDMA	Intermod Lo	wer Bandedg	e 50dB (UPL	INK)						
	Marker	1 indicates l	nighest emissi	on out of ban	d						
	Marker	2 indicates l	ngnest emissi	on inband							
# EQUIPMENT: PCS Side-to-Side Repeater FCC ID:

PROJECT NO.: 1L0129RUS1

Section 6.	Field Strength of Spurious	
NAME OF TEST: F	ield Strength of Spurious Emissions	PARA. NO.: 2.1051
TESTED BY: Chine	da PoyTTidwell	DATE: 4/20/01
Test Results:	Complies.	
Test Data:	See attached table.	
Equipment Used:	1016-1464-1043-1484-1485	
Measurement Unce	rtainty: +/- 3.6 dB	
Temperature:	22 °C	
Relative Humidity:	46 %	

### EQUIPMENT: PCS Side-to-Side Repeater FCC ID:

# PROJECT NO.: 1L0129RUS1

			Field	Strength of S	purious 1	Emissions			
Page 1	of <u>2</u>						Complete	Х	_
b No.:	1L0129R		Date	: 4/20/01			Preliminary		
pecification:	Part 24		Temperature(°C	: 22					
ested By:	Chinda Poy	y Relative Humidity(%) 46							
U.T.:	PCS Repeat	er				_			
onfiguration:	TX Full Pov	ver							
umple No:	S01								
ocation:	AC 3			RBW:	1 MHz	_	Measurement		
etector Type:	Peak			VBW:	1 MHz	_	Distance:	3	m
est Equipn	ent Used								
ntenna:				Directional Coupler:					
e-Amp:	1016			Cable #1:	1043	-			
lter:		•		Cable #2:	1484	-			
eceiver:	1464			Cable #3:	1485	-			
tenuator #1		•		Cable #4:		_			
tenuator #2:		•		Mixer:		-			
Iditional equip	oment used:			-		_			
easurement U	ncertainty:	+/-3.6 dB				_			
~		<i>a a</i>	-			EDD	EDD		
Frequency	Meter	Correction	Pre-Amp	Substitution		H H H H H	I REF	Polarity	Comments
	Reading	Factor	Gain	Antenna Gain		ENI	ERI	1 011111	
	Reading	Factor	Gain	Antenna Gain		EKI	EKI	1 olurity	
(MHz)	Reading (dBm)	Factor (dB)	Gain (dB)	Antenna Gain (dBd)		(dBm)	(mW)	1 011111	
(MHz) 3960	Reading (dBm)	Factor (dB) 40.4	Gain (dB)	Antenna Gain (dBd)		(dBm)	(mW)	V	Downlink
(MHz) 3960 5940	Reading    (dBm)    -59.2    -62.8	Factor (dB) 40.4 38.5	Gain (dB) 33.3 32.8	Antenna Gain (dBd) 8.0 9.1		(dBm) -44.1 -48.0	(mW) 0.000039 0.000016	V V V	Downlink Downlink / NF
(MHz) 3960 5940 7920	Reading    (dBm)    -59.2    -62.8    -61.2	Factor (dB) 40.4 38.5 40.4	Gain (dB) 33.3 32.8 33.4	Antenna Gain (dBd) 8.0 9.1 9.4		(dBm) -44.1 -48.0 -44.7	(mW) 0.000039 0.000016 0.000034	V V V	Downlink Downlink / NF Downlink / NF
(MHz) 3960 5940 7920 9900	Reading    (dBm)    -59.2    -62.8    -61.2    -60.5	Factor (dB) 40.4 38.5 40.4 40.4	Gain (dB) 33.3 32.8 33.4 36.1	Antenna Gain    (dBd)    8.0    9.1    9.4    10.5		(dBm) -44.1 -48.0 -44.7 -45.7	(mW) 0.000039 0.000016 0.000034 0.000027	V V V V	Downlink Downlink / NF Downlink / NF Downlink / NF
(MHz) 3960 5940 7920 9900 11880	Reading (dBm)    -59.2    -62.8    -61.2    -60.5    -61.5	Factor (dB) 40.4 38.5 40.4 40.4 -49.3	Gain (dB) 33.3 32.8 33.4 36.1 36.6	Substitution    Antenna Gain    (dBd)    8.0    9.1    9.4    10.5    11.0		(dBm) -44.1 -48.0 -44.7 -45.7 -136.4	(mW) 0.000039 0.000016 0.000034 0.000027 0.000000	V V V V V	Downlink Downlink / NF Downlink / NF Downlink / NF Downlink / NF
(MHz) 3960 5940 7920 9900 11880 13860	Reading (dBm)    -59.2    -62.8    -61.2    -60.5    -61.5    -61.2	Factor    (dB)    40.4    38.5    40.4    -49.3    47.6	Gain (dB) 33.3 32.8 33.4 36.1 36.6 34.2	Substitution    Antenna Gain    (dBd)    8.0    9.1    9.4    10.5    11.0    10.4		(dBm) -44.1 -48.0 -44.7 -45.7 -136.4 -37.4	(mW) 0.000039 0.000016 0.000034 0.000027 0.000000 0.000184	V V V V V V	Downlink Downlink / NF Downlink / NF Downlink / NF Downlink / NF Downlink / NF
(MHz) 3960 5940 7920 9900 11880 13860 15840	Reading (dBm)    -59.2  -62.8    -61.2  -60.5    -61.5  -61.2    -60.8  -60.8	Factor (dB) 40.4 38.5 40.4 40.4 -49.3 47.6 43.2	Gain (dB) 33.3 32.8 33.4 36.1 36.6 34.2 34.7	Antenna Gain    (dBd)    8.0    9.1    9.4    10.5    11.0    10.4		(dBm) -44.1 -48.0 -44.7 -45.7 -136.4 -37.4 -38.7	(mW) 0.000039 0.000016 0.000027 0.000000 0.000184 0.000135	V V V V V V V	Downlink Downlink / NF Downlink / NF Downlink / NF Downlink / NF Downlink / NF
(MHz) 3960 5940 7920 9900 11880 13860 15840 17820	Reading (dBm)    -59.2  -62.8    -61.2  -60.5    -61.5  -61.2    -60.8  -61.7	Factor (dB) 40.4 38.5 40.4 40.4 -49.3 47.6 43.2 51.0	Gain (dB) 33.3 32.8 33.4 36.1 36.6 34.2 34.7 35.1	Stocknikov    Antenna Gain    (dBd)    8.0    9.1    9.4    10.5    11.0    10.4    13.6    8.7		(dBm) -44.1 -48.0 -44.7 -45.7 -136.4 -37.4 -38.7 -37.1	(mW) 0.000039 0.000016 0.000034 0.000027 0.000000 0.000184 0.000135 0.000195	V V V V V V V	Downlink Downlink / NF Downlink / NF Downlink / NF Downlink / NF Downlink / NF Downlink / NF
(MHz) 3960 5940 7920 9900 11880 13860 15840 17820 19800	Reading (dBm)    -59.2    -62.8    -61.2    -60.5    -61.2    -60.8    -61.7    -61.0	Factor    (dB)    40.4    38.5    40.4    -49.3    47.6    43.2    51.0    53.1	Gain (dB) 33.3 32.8 33.4 36.1 36.6 34.2 34.7 35.1 34.2	Stocknikov    Antenna Gain    (dBd)    8.0    9.1    9.4    10.5    11.0    10.4    13.6    8.7    6.4		(dBm) -44.1 -48.0 -44.7 -45.7 -136.4 -37.4 -37.4 -37.1 -35.8	(mW) 0.000039 0.000016 0.000034 0.000027 0.000000 0.000184 0.000135 0.000195 0.000266	V V V V V V V V V	Downlink Downlink / NF Downlink / NF Downlink / NF Downlink / NF Downlink / NF Downlink / NF Downlink / NF
(MHz) 3960 5940 7920 9900 11880 13860 15840 17820 19800	Reading (dBm)    -59.2  -62.8    -61.2  -60.5    -61.5  -61.7    -60.8  -61.7    -61.0  -61.0	Factor    (dB)    40.4    38.5    40.4    -49.3    47.6    43.2    51.0    53.1	Gain (dB) 33.3 32.8 33.4 36.1 36.6 34.2 34.7 35.1 34.2 34.2	Stocknikov    Antenna Gain    (dBd)    8.0    9.1    9.4    10.5    11.0    10.4    13.6    8.7    6.4		(dBm) -44.1 -48.0 -44.7 -45.7 -136.4 -37.4 -37.4 -38.7 -37.1 -35.8	(mW) 0.000039 0.000016 0.000034 0.000027 0.000000 0.000135 0.000135 0.000195	V V V V V V V V V V V	Downlink Downlink / NF Downlink / NF Downlink / NF Downlink / NF Downlink / NF Downlink / NF Downlink / NF
(MHz) 3960 5940 7920 9900 11880 13860 15840 17820 19800 3960	Reading (dBm)    -59.2  -62.8    -61.2  -60.5    -61.5  -61.7    -61.0  -61.0    -53.2  -55.2	Factor (dB) 40.4 38.5 40.4 40.4 40.4 47.6 43.2 51.0 53.1 34.3 34.3	Gain (dB) 33.3 32.8 33.4 36.1 36.6 34.2 34.2 34.2 35.1 34.2 35.1 34.2 35.1 34.2	Antenna Gain    (dBd)    8.0    9.1    9.4    10.5    11.0    10.4    13.6    8.7    6.4		(dBm) -44.1 -48.0 -44.7 -45.7 -136.4 -37.4 -37.4 -38.7 -37.1 -35.8 - -44.2 -44.2	(mW) 0.000039 0.000016 0.000034 0.000027 0.0000034 0.000185 0.000195 0.000195 0.000266	V V V V V V V V V V V V V V V V	Downlink Downlink / NF Downlink / NF
(MHz) 3960 5940 7920 9900 11880 13860 15840 17820 19800 3960 5940	Reading (dBm)    -59.2  -62.8    -61.2  -60.5    -61.5  -61.2    -60.8  -61.7    -61.0  -61.2    -62.2  -62.2	Factor (dB) 40.4 38.5 40.4 40.4 -49.3 47.6 43.2 51.0 53.1 	Gain (dB) 33.3 32.8 33.4 36.1 36.6 34.2 34.7 35.1 35.1 34.2 34.2 34.7 35.1 35.1 34.2 34.2 34.2 35.1 34.2	Substitution    Antenna Gain    (dBd)    8.0    9.1    9.4    10.5    11.0    10.4    13.6    8.7    6.4    8.0    9.1		(dBm) -44.1 -48.0 -44.7 -45.7 -136.4 -37.4 -37.4 -37.4 -38.7 -35.8 - -44.2 -44.2 -49.9	(mW) 0.000039 0.000016 0.000027 0.000000 0.000184 0.000135 0.000195 0.000266 0.000266 0.000260	V V V V V V V V V V V V V V V V V	Downlink Downlink / NF Downlink / NF
(MHz) 3960 5940 7920 9900 11880 13860 15840 17820 19800 3960 5940 7920	Reading (dBm)    -59.2  -62.8    -61.2  -60.5    -61.5  -61.2    -60.8  -61.7    -61.0  -61.2    -53.2  -62.2    -57.3  -57.3	Factor (dB) 40.4 38.5 40.4 40.4 -49.3 47.6 43.2 51.0 53.1 34.3 36.0 39.8	Gain (dB) 33.3 32.8 33.4 36.1 36.6 34.2 34.7 35.1 34.2 35.1 34.2 34.7 35.1 35.1 35.1 35.1 35.1 35.1 35.1 35.1	Substitution    Antenna Gain    (dBd)    8.0    9.1    9.4    10.5    11.0    10.4    13.6    8.7    6.4    8.0    9.1    9.4		(dBm) -44.1 -48.0 -44.7 -45.7 -136.4 -37.4 -37.1 -35.8 - 	(mW) 0.000039 0.000016 0.000034 0.000027 0.000000 0.000184 0.000135 0.000195 0.000266 0.000266 0.000038	V V V V V V V V V V V V V V V V V V V	Downlink Downlink / NF Downlink / NF
(MHz) 3960 5940 7920 9900 11880 13860 15840 17820 19800 3960 5940 7920 9900	Reading (dBm)    -59.2    -62.8    -61.2    -60.5    -61.2    -60.8    -61.7    -61.0    -53.2    -62.2    -57.3    -60.0	Factor (dB) 40.4 38.5 40.4 40.4 -49.3 47.6 43.2 51.0 53.1 34.3 36.0 39.8 42.6	Gain (dB) 33.3 32.8 33.4 36.1 36.6 34.2 34.7 34.7 35.1 34.2 34.7 35.1 34.2 33.3 32.8 33.4 33.4 33.4 36.1	Antenna Gain    (dBd)    8.0    9.1    9.4    10.5    11.0    10.4    13.6    8.7    6.4    8.0    9.1		(dBm) -44.1 -48.0 -44.7 -45.7 -136.4 -37.4 -38.7 -37.1 -35.8 - -44.2 -49.9 -41.5 -43.0	(mW) 0.000039 0.000016 0.000034 0.000027 0.000000 0.000184 0.000135 0.000195 0.000266 0.000038 0.000010 0.000038	V V V V V V V V V V V V V V V V V H H H H	Downlink Downlink / NF Downlink / NF
(MHz) 3960 5940 7920 9900 11880 13860 13860 13860 13800 3960 5940 7920 9900 11880	Reading (dBm)    -59.2    -62.8    -61.2    -60.5    -61.7    -60.8    -61.7    -61.0    -53.2    -57.3    -60.0    -61.0	Factor (dB) 40.4 38.5 40.4 40.4 -49.3 47.6 43.2 51.0 53.1 	Gain (dB) 33.3 32.8 33.4 36.1 36.6 34.2 34.7 35.1 34.2 34.7 35.1 34.2 33.3 32.8 33.4 33.4 33.4 36.1 36.6	Antenna Gain    (dBd)    8.0    9.1    9.4    10.5    11.0    10.4    13.6    8.7    6.4    8.0    9.1    9.4    10.5    11.0		(dBm) -44.1 -48.0 -44.7 -45.7 -136.4 -338.7 -37.1 -35.8 -44.2 -49.9 -41.5 -43.0 -40.6	(mW) 0.000039 0.000016 0.000034 0.000027 0.00000184 0.000135 0.000195 0.000266 	V    V    V    V    V    V    V    V    V    V    V    V    V    V    H    H    H    H    H    H    H    H    H    H    H    H    H	Downlink Downlink / NF Downlink / NF
(MHz) 3960 5940 7920 9900 11880 13860 15840 17820 19800 	Reading (dBm)    -59.2    -62.8    -61.2    -60.5    -61.5    -61.7    -61.0    -62.2    -57.3    -60.0    -61.0	Factor    (dB)    40.4    38.5    40.4    40.4    40.4    40.4    40.4    51.0    53.1    34.3    36.0    39.8    42.6    46.0    50.8	Gain  Gain    (dB)  33.3    32.8  33.4    36.1  36.6    34.2  34.7    35.1  34.2    33.3  32.8    33.3  32.8    33.4  36.1    36.6  34.2	Antenna Gain    (dBd)    8.0    9.1    9.4    10.5    11.0    10.4    13.6    8.7    6.4    9.1    9.4    10.5    11.0    10.4    13.6    8.7    6.4    9.1    9.4    10.5    11.0    10.4		(dBm) -44.1 -48.0 -44.7 -45.7 -136.4 -38.7 -37.4 -38.7 -37.4 -35.8 -44.2 -49.9 -41.5 -43.0 -40.6 -33.3	(mW) 0.000039 0.000016 0.000034 0.000027 0.000008 0.000135 0.000135 0.000135 0.000135 0.000038 0.000038 0.000071 0.000050 0.000050 0.000058 0.0000473	V V V V V V V V V V V V V V V V H H H H	Downlink Downlink / NF Downlink / NF
(MHz) 3960 5940 7920 9900 11880 13860 15840 17820 19800 	Reading (dBm)    -59.2    -62.8    -61.2    -60.5    -61.7    -61.0    -53.2    -62.2.2    -57.3    -60.0    -61.0    -62.2    -65.3.2    -62.2    -57.3    -60.0    -61.0    -60.3    -60.5	Factor    (dB)    40.4    38.5    40.4    40.4    40.3    40.4    40.4    40.4    40.4    40.4    40.4    38.5    34.3    36.0    39.8    42.6    46.0    50.8    44.0	Gain  Gain    (dB)  33.3    32.8  33.4    36.1  36.6    34.2  34.7    35.1  34.2    33.3  32.8    33.3  32.8    35.1  34.2    33.3  32.8    33.4  36.1    36.1  36.6    34.2  36.1    36.6  34.2    34.7  34.7	Antenna Gain    (dBd)    8.0    9.1    9.4    10.5    11.0    10.4    13.6    8.7    6.4    9.1    9.4    10.5    11.0    10.5    11.0    10.5    11.0    10.4		(dBm) -44.1 -48.0 -44.7 -45.7 -136.4 -37.4 -37.4 -37.1 -35.8 -44.2 -49.9 -41.5 -43.0 -40.6 -33.3 -37.6	(mW) 0.000039 0.000016 0.000034 0.000027 0.0000135 0.000135 0.000135 0.000195 0.000266 0.000038 0.000017 0.000050 0.000088 0.000473 0.000173	V V V V V V V V V V V V V V V V H H H H	Downlink Downlink / NF Downlink / NF
(MHz) 3960 5940 7920 9900 11880 13860 15840 17820 19800 3960 5940 7920 9900 11880 13860 136	Reading (dBm)    -59.2    -62.8    -61.2    -60.5    -61.7    -61.0    -53.2    -62.8    -61.7    -61.0    -62.3    -60.0    -61.0    -60.3    -60.5    -59.8	Factor    (dB)    40.4    38.5    40.4    -49.3    47.6    43.2    51.0    53.1    34.3    36.0    39.8    42.6    46.0    50.8    44.0    53.6	Gain (dB) 33.3 32.8 33.4 36.1 36.6 34.2 34.2 34.7 35.1 34.2 35.1 34.2 33.3 32.8 33.4 36.1 36.6 34.2 34.2 33.3 32.8 33.4 36.6 36.6 34.2 34.7 35.1	Antenna Gain    (dBd)    8.0    9.1    9.4    10.5    11.0    10.4    13.6    8.7    6.4    9.1    9.4    10.5    11.0    10.5    11.0    10.5    11.0    10.4    13.6    8.7		(dBm) -44.1 -48.0 -44.7 -45.7 -136.4 -37.4 -37.4 -38.7 -37.1 -35.8 -44.2 -49.9 -41.5 -43.0 -40.6 -33.3 -37.6 -32.6	(mW) 0.000039 0.000016 0.000034 0.000027 0.000000 0.000185 0.000195 0.000266 0.000038 0.000019 0.000071 0.0000088 0.000073 0.000073 0.000173 0.000173	V V V V V V V V V V V V V V V V H H H H	Downlink Downlink / NF Downlink / NF

# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

PROJECT NO.: 1L0129RUS1

# Test Data – Field Strength of Spurious

			Field S	Strength of S	purious Emissio	ns		
Page 2 o	of <u>2</u>					Complete	Х	
Job No.:	IL0129R  Da    Part 24  Temperature(°    Chinda Poy  Relative Humidity(		Date: 4/20/01 Preliminary					
Specification:			Temperature(°C):	22				-
Tested By:			Relative Humidity(%)	46				
E.U.T.:	PCS Repeater							
Configuration:	TX Full Pov	ver						
Sample No:	<u>S01</u>			i				
Frequency	Meter	Correction	Pre-Amp	Substitution	ERP	ERP	Polarity	Comments
	Reading	Factor	Gain	Antenna Gain				
(MHz)	(dBm)	(dB)	(dB)	(dBd)	(dBm)	( <b>mW</b> )		
3800	-61.7	40.4	33.3	8.0	-46.6	0.000022	v	Unlink / NF
5700	-62.5	38.5	32.5	91	-47.4	0.000018	v	Uplink / NF
7600	-61.5	40.4	33	9.4	-44.6	0.000034	v	Uplink / NF
9500	-61.8	40.4	35.9	10.5	-46.8	0.000021	v	Uplink / NF
11400	-60.3	42.0	36.5	11.1	-43.8	0.000042	v	Uplink / NF
13300	-60.8	44.8	34.8	11.2	-39.6	0.000109	V	Uplink / NF
15200	-61.3	46.5	33.8	11.4	-37.2	0.000190	V	Uplink / NF
17100	-61.0	47.0	34.5	11.7	-36.7	0.000212	v	Uplink / NF
19000	-60.8	53.1	34.3	6.4	-35.7	0.000272	V	Uplink / NF
						0.000272		-1
3800	-55.3	34.3	33.3	8.0	-46.3	0.000024	Н	Uplink
5700	-62.7	36.0	32.5	9.1	-50.1	0.000010	Н	Uplink / NF
7600	-60.5	39.8	33	9.4	-44.3	0.000037	Н	Uplink / NF
9500	-61.3	42.6	35.9	10.5	-44.1	0.000039	Н	Uplink / NF
11400	-57.7	44.4	36.5	11.1	-38.7	0.000134	Н	Uplink
13300	-60.5	47.5	34.8	11.2	-36.7	0.000214	Н	Uplink / NF
15200	-61.7	47.1	33.8	11.4	-37.0	0.000198	Н	Uplink / NF
17100	-60.7	50.5	34.5	11.7	-33.0	0.000505	Н	Uplink / NF
19000	-61.5	54.6	34.3	6.4	-34.8	0.000334	Н	Uplink / NF
Notes	: 50 dB / Up	olink 1900 MH	z / Scanned to the 10t	h Harmonic				-

### EQUIPMENT: PCS Side-to-Side Repeater FCC ID:

# PROJECT NO.: 1L0129RUS1

# Test Data – Field Strength of Spurious—High Gain

				Field S	trength of S	purious l	Emissions			
Page 1 o	f <u>2</u>							Complete	Х	_
Job No.:	1L0129R	0129R Date: 4/20/01					Preliminary		-	
Specification:	Part 24		Temperature(°C): 22							-
Tested By:	Chinda Poy		Relative	Relative Humidity(%) 46						
E.U.T.:	PCS Repeat	er								
Configuration:	TX Full Pov	ver					-			
Sample No:	S01						-			
Location:	AC 3				RBW:	1 MHz		Measurement		
Detector Type:	Peak				VBW:	1 MHz	-	Distance:	3	m
					-		-			-
Test Equipm	ent Used									
Antenna:				D	irectional Coupler:		_			
Pre-Amp:	1016				Cable #1:	1043	_			
Filter:					Cable #2:	1484	_			
Receiver:	1464				Cable #3:	1485	_			
Attenuator #1					Cable #4:		_			
Attenuator #2:					Mixer:		_			
Additional equip	ment used:						_			
Measurement Un	certainty:	+/-3.6 dB	-							
Frequency	Meter	Correction		Pre-Amn	Substitution		FRP	FRP	Polarity	Comments
Trequency	Reading	Factor		Gain	Antenna Cain		LINI	LM	Totarity	Comments
	Reading	Factor		Gam	Antenna Gam					
(MHz)	(dBm)	( <b>dB</b> )		(dB)	(dBd)		(dBm)	( <b>mW</b> )		
3960	-58.7	40.4		33.3	8.0		-43.6	0.000043	v	Downlink
5940	-63.0	38.5		32.8	9.1		-48.2	0.000015	V	Downlink / NF
7920	-61.0	40.4		33.4	9.4		-44.5	0.000035	V	Downlink / NF
9900	-60.2	40.4		36.1	10.5		-45.4	0.000029	v	Downlink / NF
11880	-61.0	-49.3		36.6	11.0		-135.9	0.000000	V	Downlink / NF
13860	-60.3	47.6		34.2	10.4		-36.5	0.000226	V	Downlink / NF
15840	-60.3	43.2		34.7	13.6		-38.2	0.000152	V	Downlink / NF
17820	-60.8	51.0		35.1	8.7		-36.2	0.000240	v	Downlink / NF
19800	-61.2	53.1		34.2	6.4		-36.0	0.000254	v	Downlink / NF
3960	-51.5	34.3		33.3	8.0		-42.5	0.000057	Н	Downlink
5940	-62.2	36.0		32.8	9.1		-49.9	0.000010	Н	Downlink / NF
7920	-60.0	39.8		33.4	9.4		-44.2	0.000038	Н	Downlink / NF
9900	-60.0	42.6		36.1	10.5		-43.0	0.000050	Н	Downlink / NF
11880	-56.0	46.0		36.6	11.0		-35.6	0.000278	Н	Downlink
13860	-60.0	50.8		34.2	10.4		-33.0	0.000507	Н	Downlink / NF
15840	-59.2	44.0		34.7	13.6		-36.3	0.000234	Н	Downlink / NF
17820	-60.0	53.6		35.1	8.7		-32.8	0.000525	Н	Downlink / NF
19800	-61.5	54.6		34.2	6.4		-34.7	0.000342	Н	Downlink / NF
Notes	60 dB / Do	wnlink 1980 N	IHz / Sca	nned to the	10th harmonic		•		·	-

# EQUIPMENT: PCS Side-to-Side Repeater

FCC ID:

# PROJECT NO.: 1L0129RUS1

			Field S	Strength of S	Spurious Emissions			
Page 2 o	f <u>2</u>					Complete	Х	
Job No.:	1L0129R		Date:	4/20/01		Preliminary		•
Specification:	Part 24		24 Temperature(°C): 22				•	
Tested By:	Chinda Poy		Relative Humidity(%) 46					
E.U.T.:	PCS Repeate	er						
Configuration:	TX Full Pow	ver						
Sample No:	<u>S01</u>			,				
Frequency	Meter	Correction	Pre-Amp	Substitution	ERP	ERP	Polarity	Comments
	Reading	Factor	Gain	Antenna Gain			,	
(MHz)	(dBm)	(dB)	(dB)	(dBd)	(dBm)	( <b>mW</b> )		
3800	-60.2	40.4	33.3	8.0	-45.1	0.000031	V	Unlink / NF
5700	-62.8	38.5	32.5	9.1	-47.7	0.000017	v	Uplink / NF
7600	-61.8	40.4	33	9.4	-44.9	0.000032	v	Uplink / NF
9500	-61.8	40.4	35.9	10.5	-46.8	0.000021	v	Uplink / NF
11400	-61.5	42.0	36.5	11.1	-45.0	0.000032	v	Uplink / NF
13300	-60.5	44.8	34.8	11.2	-39.3	0.000117	V	Uplink / NF
15200	-61.2	46.5	33.8	11.4	-37.1	0.000194	V	Uplink / NF
17100	-61.2	47.0	34.5	11.7	-36.9	0.000202	v	Uplink / NF
19000	-61.8	53.1	34.3	6.4	-36.7	0.000216	V	Uplink / NF
								1
3800	-54.8	34.3	33.3	8.0	-45.8	0.000026	Н	Uplink
5700	-62.2	36.0	32.5	9.1	-49.6	0.000011	Н	Uplink / NF
7600	-60.5	39.8	33	9.4	-44.3	0.000037	Н	Uplink / NF
9500	-61.2	42.6	35.9	10.5	-44.0	0.000040	Н	Uplink / NF
11400	-58.0	44.4	36.5	11.1	-39.0	0.000125	Н	Uplink
13300	-60.8	47.5	34.8	11.2	-37.0	0.000200	Н	Uplink / NF
15200	-61.3	47.1	33.8	11.4	-36.6	0.000217	Н	Uplink / NF
17100	-61.3	50.5	34.5	11.7	-33.6	0.000440	Н	Uplink / NF
19000	-61.0	54.6	34.3	6.4	-34.3	0.000375	Н	Uplink / NF
Notes	: 60 dB / Up	olink 1900 MH	z / Scanned to the 10t	h Harmonic				-

# Test Data – Field Strength of Spurious—High Gain

EQUIPMENT: PCS Side-to-Side Repeater FCC ID:

PROJECT NO.: 1L0129RUS1

# Photographs of Test Setup

FRONT VIEW



#### **REAR VIEW**



# NEMKO Dallas

# FCC PART 24, SUBPART E BROADBAND PCS REPEATERS

# EQUIPMENT: PCS Side-to-Side Repeater FCC ID:

PROJECT NO.: 1L0129RUS1

# Section 7. Frequency Stability

NAME OF TEST: Frequency	y Stability	PARA. NO.: 2.1055
TESTED BY: TTidwell		DATE:
Test Results: Measurement Date:	Com <b>As. ppliC</b> See attached table.	adie
	Standard Test Frequency: Standard Test Voltage:	MHz
Equipment Used:		
Measurement Uncertainty:	+/- 1.6 dB	
Lab Temperature: °	С	
Relative % Humidity:	6	

# EQUIPMENT: PCS Side-to-Side Repeater FCC ID:

PROJECT NO.: 1L0129RUS1

# Section 8. Test Equipment List

ASSET	Description	Manufacturer Model Number	Serial Number	Cal. Date	Cal. Due
1036	SPECTRUM ANALYZER	ROHDE & SCHWARZ FSEK30	830844/006	06/14/99	06/14/01
1477	20db Attenuator DC 18 Ghz	MCL Inc. BW-S20W5	NONE	CBU	N/A
1082	CABLE 2m	Astrolab 32027-2-29094-72TC	N/A	05/23/00	05/23/01
1464	Spectrum analyzer	Hewlett Packard 8563E	3551A04428	01/02/01	01/02/02
1016	AMPLIFIER	HEWLETT PACKARD 8449A	2749A00159	05/24/00	05/24/01
1043	Flexable cable 1m	Astrolab Inc. 32027-2-29094K-1M	0	01/29/01	01/29/02
1484	Cable 2.0-18.0 Ghz	Storm PR90-010-072	N/A	05/25/00	05/25/01
1485	Cable 2.0-18.0 Ghz	Storm PR90-010-216	N/A	05/25/00	05/25/01

EQUIPMENT:	PCS Side-to-Side Repeater
FCC ID:	

PROJECT NO.: 1L0129RUS1

# ANNEX A - TEST DETAILS

### EQUIPMENT: PCS Side-to-Side Repeater FCC ID:

# PROJECT NO.: 1L0129RUS1

### NAME OF TEST: RF Power OutputPARA. NO.: 2.1046

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

#### 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<sup>2</sup> = E<sup>2</sup>/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

#### EQUIPMENT: PCS Side-to-Side Repeater FCC ID:

# PROJECT NO.: 1L0129RUS1

### 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:

#### <u>CDMA</u>

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.

### <u>NADC</u>

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

#### EQUIPMENT: PCS Side-to-Side Repeater FCC ID:

# PROJECT NO.: 1L0129RUS1

#### 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<br/>frequency block, the power of any emission shall be attenuated<br/>below the transmitter power by at least 43 + 10 log (P) dB.

#### **Method Of Measurement:**

Spectrum analyzer settings:

#### <u>CDMA</u>

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

### <u>NADC</u>

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

### <u>GSM</u>

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.

### EQUIPMENT: PCS Side-to-Side Repeater FCC ID:

PROJECT NO.: 1L0129RUS1

### 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<br/>frequency block, the power of any emission shall be attenuated<br/>below the transmitter power by at least 43 + 10 log (P) dB.

#### **Calculation Of Field Strength Limit**

An example of attenuation requirement of 43 + 10 Log P is equivalent to  $-13 \text{ dBm} (5 \times 10^{-5} \text{ Watts})$  at the antenna terminal. We determine the field strength limit by using the plane wave relation.

 $GP/4\pi R^2 = E^2/120\pi$ 

For emissions  $\leq 1$  GHz:

G = 1.64 (Dipole Gain)  $P = 10^{-5}$  Watts (Maximum spurious output power) R = 3m (Measurement Distance)

$$E = \frac{\sqrt{30GP}}{R}$$
$$E = \frac{\sqrt{30 \times 1.64 \times 5 \times 10^{-5}}}{3} = 0.016533 \text{ V} / \text{m} = 84.4 \text{ dB} \text{mV} / \text{m}$$

For emissions > 1 GHz:

G = 1 (Isotropic Gain)  $P = 1 \times 10^{-5}$  Watts (Maximum spurious output power) R = 3m (Measurement Distance)

$$E = 84.4 - 20 \log \sqrt{1.64} = 82.3 dB \,\mathrm{mV} / m@3m$$

### EQUIPMENT: PCS Side-to-Side Repeater FCC ID:

PROJECT NO.: 1L0129RUS1

#### 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.

EQUIPMENT:	PCS Side-to-Side Repeater
FCC ID:	_

PROJECT NO.: 1L0129RUS1

# **ANNEX B - TEST DIAGRAMS**

# EQUIPMENT: PCS Side-to-Side Repeater FCC ID:

PROJECT NO.: 1L0129RUS1

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



# Para. No. 2.989 - Occupied Bandwidth



PROJECT NO.: 1L0129RUS1

# Para. No. 2.991 Spurious Emissions at Antenna Terminals



# EQUIPMENT: PCS Side-to-Side Repeater FCC ID:

PROJECT NO.: 1L0129RUS1

# Para. No. 2.993 - Field Strength of Spurious Radiation



Para. No. 2.995 - Frequency Stability



EQUIPMENT: PCS Side-to-Side Repeater FCC ID:

PROJECT NO.: 1L0129RUS1