CI Wireless Inc.

PRODUCT SPECIFICATION

MirrorCell® Cellular Band CDMA Channel Selective Repeater

Model: CDR-812
Model: CDR-801

Written By: Leo Kha
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Date Revised: None

Replaces Rev: None

CONTENTS

1 INTRODUCTION

1.1 Scope

This document establishes the electrical, mechanical, environmental and reliability specifications for the Cellular Band CDMA Channel Selective Repeater.

1.2 Related Document

Acceptance Test Procedure ATP-
Test Data Sheet TDS

2 SYSTEM DESCRIPTION

2.1 General

The Channel Selective Repeater is used to extend the radio frequency (RF) coverage of the base station. The repeater is well suited for providing RF coverage into shopping centers, convention centers, tunnels, office buildings, and other areas where the signal blockage does not allow direct coverage from the base station.

The repeater is designed for TIA/EIA/IS-95, titled “Mobile Station-Base Station Compatibility Standard for Dual-Mode Wideband Spread Spectrum Cellular System.”

Operations, Administration and Maintenance (OA&M) functionality of the repeater provides the service provider with local as well as remote monitor, control, configure and maintain the system. The system is capable of providing over 10,000 user-defined address to allow over 10,000 repeaters in the operator’s system. Local access is provided through a RS232 port on the controller located inside the repeater. Remote access is provided through a RS232 modem connecting to a landline or via a CDMA subscriber unit mounted in the repeater.

An aluminum enclosure with cooling fins houses the repeater. Both transmit and receive antenna connections are located on the underside of the repeater. The external connections on the bottom are protected from unauthorized access with a cover, which can be opened only from the inside of the repeater.

2.2 System Description

2.2.1 Model Numbers & Options

Table 2.2.1-1 MIRRORCELL® Cellular Band CDMA Channel Selective Repeater

BASE MODEL NUMBER

CDR 801 CDMA 800 Channel Selective Repeater - 1 Channel
CDR 812 CDMA 800 Channel Selective Repeater - 2 Channels

BAND

X All bands (824-849 MHz Reverse Link; 869-894 MHz Forward Link)

INTERFACES

"*Telephone line interface with Modem*" includes everything required to connect standard phone line to the repeater for remote connection to OMC computer

200	None
201	Telephone line interface with Modem
2XX	Special

POWER SOURCE

300	110 V - with US standard power receptacle
310	220 V - with CE 7/7 European power receptacle
320	24 V – DC Input
3XX	Special

POWER BACKUP

400	None
420	PowerPack MPP100
4XX	Special

CONNECTOR OPTION

500	7/16' DIN Connectors
510	Type "N" Connectors
5XX	Special

POWER OPTION

740	10W/Channel
737	5W/Channel (2 Channels)

RX DIVERSITY

810	Receive Diversity

2.2.2 Part Numbers and Description

2.2.3 System Block Diagrams

TWO CHANNEL CELLULAR BAND CDMA REPEATER
(with Rx Diversity)

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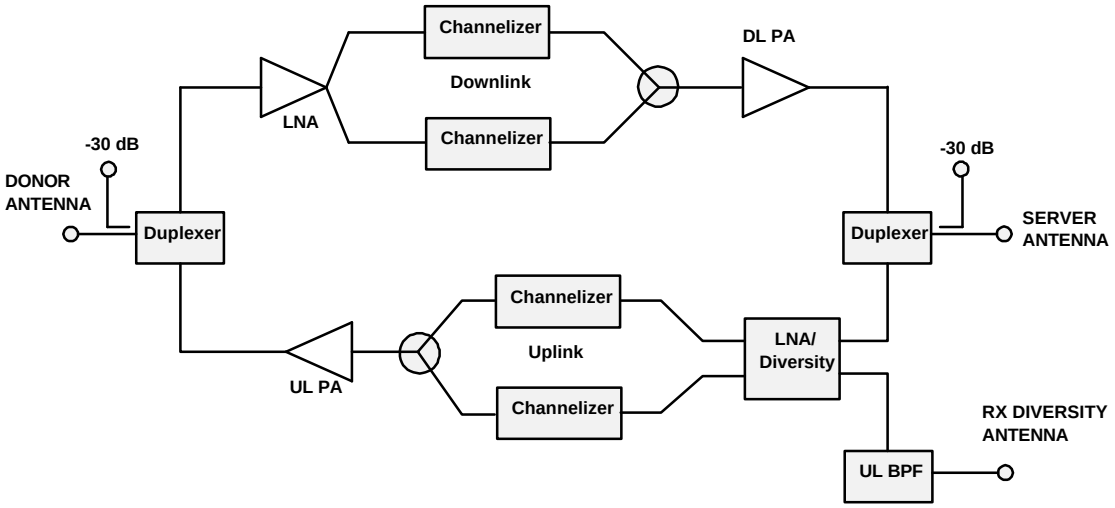

TWO CHANNEL CELLULAR BAND CDMA REPEATER

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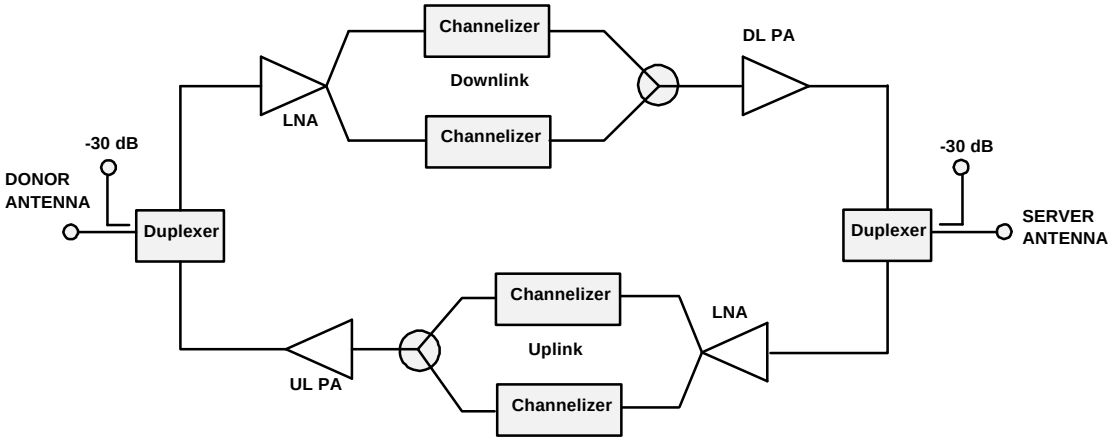

3 SPECIFICATIONS

3.1 Electrical Requirement

3.1.1 Channel and Frequency Plan

The frequency band for the reverse link (uplink) is from 824 to 849 MHz and the frequency band for the forward link (downlink) is from 869 to 894 MHz and each channel spacing is 30 KHz. The Channel numbers that support CDMA operations are 1013 through 1023, 1 through 311, 356 through 644, 689 through 694, and 739 through 777 inclusive, as shown in the following table.

Table 3.1.1-1 CDMA Channel Numbers and Corresponding Frequencies

System	Valid CDMA Frequency Assignments	Analog Channel Count	CDMA Channel Count	Reverse Link Frequency Assignment	Forward Link Frequency Assignment
A" (1 MHz)	/ / / / / / / / / / /	22	991 1012	824.040 824.670	869.040 869.670
	CDMA	11	1013 1023	824.700 825.000	869.700 870.000
A (10 MHz)	CDMA	311	1 311	825.030 834.330	870.030 879.330
	/ / / / / / / / / / /	22	312 333	834.360 834.990	879.360 879.990
B (10 MHz)	/ / / / / / / / / / /	22	334 355	835.020 835.650	880.020 880.650
	CDMA	289	356 644	835.680 844.320	880.680 889.320
	/ / / / / / / / / / /	22	645 666	844.350 844.980	889.350 889.980
A' (1.5 MHz)	/ / / / / / / / / / /	22	667 688	845.010 845.640	890.010 890.640
	CDMA	6	689 694	845.670 845.820	890.670 890.820
	/ / / / / / / / / / /	22	695 716	845.850 846.480	890.850 891.480
B' (2.5 MHz)	/ / / / / / / / / / /	22	717 738	846.510 847.140	891.510 892.140
	CDMA	39	739 777	847.170 848.310	892.170 893.310
	/ / / / / / / / / / /	22	778 799	848.340 848.970	893.340 893.970

Frequencies in shaded (/ / / / / /) regions are not valid for CDMA frequency assignments.

Table 3.1.1-2 CDMA Channel Number to CDMA Frequency Assignment Correspondence

	CDMA Channel Number	CDMA Frequency Assignment, MHz
Reverse Link	1 ≤ N ≤ 777	0.030 N + 825.000
	1013 ≤ N ≤ 1023	0.030 (N-1023) + 825.000
Forward Link	1 ≤ N ≤ 777	0.030 N + 870.000
	1013 ≤ N ≤ 1023	0.030 (N-1023) + 870.000

3.1.2 Electrical Specifications

Table 3.1.2 Repeater Electrical Specifications

Parameters	Reverse Link	Forward Link
Frequency	See Table 3.1.1	See Table 3.1.1
Channel Bandwidth	1.23 MHz	1.23 MHz
Output Power Limit (Per Channel) - **737 (5 Watts)** - **740 (10 Watts)**	 24 dBm (± 1 dB) 27 dBm (± 1 dB)	 37 dBm (+1,-0.5 dB) 40 dBm (+1,-0.5 dB)
Noise Figure at Max Gain **Noise Figure at Min Gain**	≤ 5 dB	≤ 5 dB N/A
Gain at Minimum Attenuation	95 dB (± 2 dB)	95 dB (± 2 dB)
Digital Attenuator Range	0 to 30 dB 2 dB steps (± 1 dB)	0 to 30 dB 2 dB steps (± 1 dB)
Spectral Regrowth @ Max Output Power (0-30 dB Attenuation Range) **@ ± 750 KHz Offset (30 KHz BW)** **@ 1.98 MHz Offset (30 KHz BW)**		 < -45 dBc < -60 dBc
Spectral Regrowth @ Max Output Power @ Max Gain: **@ ± 885 KHz Offset (30 KHz BW)** **@ 1.98 MHz Offset (30 KHz BW)**	 < -42 dBc < -54 dBc	
Flatness over 1.23 MHz	2.5 dB (p-p)	2.5 dB (p-p)
Gain Change over 25 MHz BW	± 2 dB	± 2 dB
Gain Change over temperature **(-25 to 50 °C operating ambient temp.)**	± 2 dB	± 2 dB
Return Loss (I/O)	> 14 dB	> 14 dB
Signal Electrical Delay	11 usec (Typical)	11 usec (Typical)
Impedance	50 ohm	50 ohm
Donor/Server Test Ports Coupling	-30 ± 2 dB	-30 ± 2 dB

3.2 Mechanical Requirement

MECHANICAL SPECIFICATIONS	
Housing (W x H x D)	12.5 x 21 x 11.5 inches
Housing, with metal cover and anchorable feet	17.25 x 21.0 x 11.8 inches
Weight	47 +/- 2 pounds, completely loaded
Housing Material	aluminum
Connection Panel	protected against unauthorized access
Color	grey (painted)
Cooling	external convection; no ventilation slots

3.3 Interface Requirement

3.3.1 AC Power

Primary AC power: 105-130 Vac, 50-60 Hz (230 Vac Optional)
Rated Input Current:
1 Channel 10W:
2 Channel 5W/per:

3.3.2 DC Power

24VDC Optional

3.4 Environmental Requirement

ENVIRONMENTAL SPECIFICATIONS	
EMI	Meets specifications for influx of an electromagnetic field of 10V/m between 100 kHz-1 GHz, excluding band of operation.
Operating Temperature	-25 to 50° C, conforms to Bellcore specification GR-63-CORE, section 5.1.2
Storage Temperature	-40 to 75° C
Weather Resistance: **Pin Fin Enclosure**	NEMA 4 Rated
Shipping	Bellcore GR-63-CORE, sections 5.3 and 5.4.3

3.5 Certifications

CERTIFCATIONS	
FCC ID	
Canada	
UL	

4 STATUS & CONTROL

4.1 General

The monitor and control functions of the repeater is enabled by the use of a status and control unit (Controller) located inside the Repeater. This module determines the status of all channelizers and identifies all failure conditions. When a failure alarm occurs, the controller can send a message by dialing out using a landline modem or a mobile handset to an OMC or to a PC over a serial data link. The PC connection is over a seral port through an RS232 interface to a VT-100 terminal.

The controller module allows the monitor, control and configuration of numerous important parameters such as channel number, attenuation setting, output power level, temperature reading and over health of the repeater.

4.2 Settings

The physical interface to the controller module consists of a VT-100 Terminal, connected via RS-232 cable with a male DB9 connector on the repeater end.

Communication format: *9600 baud, 8 bit, 1 stop bit, no parity, no flow control.*

4.3 Login via Local Maintenance Terminal (LMT)

When the PC is connected, the login sequence is activated by user-input keystrokes.

The login sequence begins by asking for username and password. Different user accounts may have different authorities. The default login parameters are:

Username	**Password**	**Authority**
USERNAM1	PASSWRD1	read/write
USERNAM2	PASSWRD2	read/write
USERNAM3	PASSWRD3	read only
USERNAM4	PASSWRD4	read only

WARNING! The username and password should be changed during installation. For example, to change the second user name and password:

SET UID 2 CIWIRELESS
SET PWD 2 AHAMBRA

The control module logs the allowable number of failed login attempts. If this count exceeds the user defined maximum (default = 8), then future login attempts are no longer allowed. The false login count value is decremented by one every hour. This means that it takes one hour after reaching the maximum number of failed login attempts, before a successful login can be initiated.

4.4 Commands

The control module does not differentiate between upper- and lower case characters.

Available commands:

MODEM	gives information about the current modem configuration
CLEAR	clears the display
CLOCK	displays a real-time clock
HELP	displays a quick overview of commands
LOG	shows the alarm log
LOGOUT	ends the work session
STATUS	displays the RF parameters (channel number, attenuation, etc.), as well as peripheral parameters (current draw, status of cover)
SYSTEM	shows system data (numbers of received/transmitted messages)
SET, GET	These commands allow the monitor and control of the repeater parameters

ENABLE DTC enables protocol modes
DISABLE DTC disables protocol modes

WARNING: The command fields must be completely used, otherwise an error results.

For example:

SET CHA [X] [YYYY] [N] [MMMM] <enter>

X	=	Channel 1 within the repeater
YYYY	=	CDMA channel number for channelizer 1 (see Table 3.11.1-1)
N	=	Channel 2 within the repeater (optional)
MMMM	=	CDMA channel number for channelizer 2 (see Table 3.11.1-1)

For example,

SET CHA 1 356 2 644 <enter>

sets the repeater's channel 1 to CDMA channel 356 and the repeater's channel 2 to CDMA channel 644.

Two parameters are only writable, not readable; these are "user name" and "password".

4.5 Alarms and Controls

The Unit should report the following Alarm conditions and information using either the landline interface or the wireless interface. Alarms that are based on a value (i.e. temperature, power, etc.) should allow limits to be set for alarm conditions. All alarms should cause a visual indication (LED on the status and control module to turning red) unless otherwise indicated:

Synthesizer Lock	Reports if channelizer's synthesizer is locked; automatically attenuates when the repeater goes out of lock
Communications lock	Status of communication to each module
Temperature	Reports temperature within unit
Door Alarm	Reports if door is open or closed (remote only, no visual)
Output Power DL	Reports output power of downlink amplifier

Controls:
Frequency Channel, Forward and Reverse paths
Gain, Forward and Reverse paths
Peak limiting on output power
Keep-alive lock

4.6 Command Log

A command log, kept in the control module, stores the last ten commands that have been entered. Use the up and down arrow keys to read off these stored commands. The right and left arrow keys may then be used, along with the backspace and clear buttons, to edit the command.

4.7 Quick Commands

Three quick commands are available with the function keys:
F1: help menu
F2: shows a list with the last ten entered commands
F3: status data

4.8 External Alarms Configuration

The external alarms can be configured active-low or active-high, so that the alarm is given either in the presence or absence of applied power. For configuration, use the following command:
SET EXT B C
B refers to pin 1 and C to pin 2.
B,C = 0 means that the absence of voltage is ok

B,C = 1 means that the presence of voltage is ok
The alarms are laid out so that pin 1 is read off from DA0, while pin 2 is read from DA1.

4.9 LED Indicators

The LED's on the control module are tri-color, where the illuminated colors have distinct meanings:

Green	Repeater is functioning properly
Red	Repeater is not functioning properly
Amber	User logged in to control module.

WARNING: Depending on alarm configuration, the door alarm may go off some number of seconds after the door has been opened; in this case, the LED will turn red.

4.10 Command Attributes

4.10.1 Read and Write				
Designation	**Abbrv.**	**Format**	**Description**	**Comments**
Repeater-ID	RID	XX-YY-ZZZZ	10 characters; X, Y, and Z digits	
Date	DAT	DDMMYY	6 digits	
Time	TIM	HHMMSS	6 digits	24-Hour time
Addresses	ADD		1 digit, space, 1 character,max 15 digits, N=selector ($1 \leq N \leq 4$)	Phone number to which repeater reports messages. Up to 4 separate numbers allowed.
Main Address	MAD	N	1 digit; ($1 \leq N \leq 4$)	
Message numbers	MSG	N MMMMM	1 digit, space, 5 digits N = selector; ($1<N<4$)	last number from the message sent by the repeater, defined by the selector N, wrap-around counter. Set to zero after correction.
Repetition cycle heartbeat	RCH	NNNN	4 digits	Interval between "heartbeat" updates from repeater, in minutes.
Repetition cycle alarm	RCA	NNN	3 digits	time repeater waits before retransmitting unconfirmed alarm
Max. Number of repetitions	MNR	NN	2 digits	maximum number of RCA attempts
Timeout for LMT	LMT	NN	2 digits	point in time to switch from LMT to remote interface (min.)
Invalid login attempts	ILA	CC	2 digits	number of consecutive invalid login attempts before an alarm is generated. The number is independent of the user-ID.
Channels	CHA	X YYY N MMM	1 digit, space, 3 digits, space, 1 digit, space, 3 digits X, N=channel selector $1 \leq (X,N) \leq 4$	X, N = repeater's channel $1 \leq (X,N) \leq 4$ YYY, MMM=CDMA channel number corresponding to a frequency

Attenuation level, uplink	ATU	X YY N MM	1 digit, space, 2 digits, space, 1 digit, space, 2 digits	X,N = repeater's channel YY,MM = attenuation level, 0 - 30dB
Attenuation level, downlink	ATD	X YY N MM	1 digit, space, 2 digits, space, 1 digit, space, 2 digits	X,N = repeater's channel YY,MM = attenuation level, 0 - 30dB
Maximum output, uplink	LVU	X YY N MM	1 digit, space, 2 digits, space, 1 digit, space, 2 digits	X,N = repeater's channel YY, MM = Maximum output level, uplink; = 27, 30, or 33dB
Maximum output, downlink	LVD	X YY N MM	1 digit, space, 2 digits, space, 1 digit, space, 2 digits	X,N = repeater's channel YY, MM = Maximum output level, downlink; = 27, 30, or 33dB
Alarm	ALA	AAA X Y E LLL UUU SSS	3 letters, space, 1 digit, space, 1 digit, space, 3 digits, space, 3 digits, space, 3 digits AAA = SZU..POW and DA0..DA9 (right table) and VLI..ILI (right table) X:0=possible, 1=not possible Y:0=confirmed, 1=unconfirmed E=1: decrease both limits E=2: decrease lower limit E=3: decrease upper limit E=4: ingore the limit values, for example for door open/closed	AAA = alarmcode X = alarm transmission possible/not possible Y = whether alarm must be confirmed by the OMC E = indication whether limits have been set LLL= lower limit UUU = upper limit SSS= number of seconds that the value has been outside the acceptable range, causing an alarm to be generated.

4.10.2 Read Only				
Designation	**Abbrv.**	**Format**	**Description**	**Comments**
Repeater Info	RIN	CC..CC	max. 120 characters	defined by manufacturer
Vendor Name	VND	CC..CC	max. 120 characters	defined by manufacturer
Hardware version No.	HWV	CC..CC	max. 120 characters	defined by manufacturer
Software version No.	SWV	CC..CC	max. 120 characters	defined by manufacturer
Number of channels	NCH	N	1 digit $1 \leq N \leq 4$	number of channels in repeater
Maximum Gain	MGA	GG	2 digits	GG = max. gain of the repeater (dB)
Synthesizers uplink	SZU	BBBB	4 digits, the first digit represents the status of channel 1 of the synthesizer (uplink), etc. 0=ok, 1 = not ok	synthesizer per uplink channel
Synthesizers downlink	SZD	BBBB	4 digits, the first digit represents the status of channel 1 of the synthesizer (downlink), etc. 0=ok, 1 = not ok	synthesizer per downlink channel
Amplifiers uplink	AMU	BBBB	4 digits, the first digit represents the status of the amplifier for channel 1 (uplink), etc. 0=ok, 1 = not ok	amplifier per uplink channel
Amplifiers downlink	AMD	BBBB	4 digits, the first digit represents the status of the amplifier for channel 1 (downlink), etc. 0=ok, 1 = not ok	amplifier per downlink channel
Global amplifier uplink	GAU	B	0 = ok, 1=not ok	final stage uplink
Global amplifier downlink	GAD	B	0 = ok, 1=not ok	final stage downlink
Temperature	TEM	B	0 = ok, 1=not ok	temperature status
Door open/close	DOO	B	0 = closed, 1=open	door open/closed
Power Supply	POW	B	0 = ok, 1=not ok	power amplifier
Dummy Alarm 0	DA0	B	0 = ok, 1=not ok	external connection 1
Dummy Alarm 1	DA1	B	0 = ok, 1=not ok	external connection 2
Dummy Alarm 2	DA2	B	0 = ok, 1=not ok	internal protocol error

4.10.3 Write Only				
Designation	**Abbrv.**	**Format**	**Description**	**Comments**
User ID	UID	N CCCCCCCC	1 digit, space, max. 8 characters N=selector; (1< N< 4)	user ID 1 and 2 read and write user ID 3 and 4 read only
Passwords	PWD	N CCCCCCCC	1 digit, space, max. 8 characters N=selector; (1< N< 4)	

4.10.4 Event Drivers				
Designation	**Abbrv.**	**Format**	**Description**	**Comments**
Alarm acknowledge	ACK	NNNNN	5 digits	number of the alarm that must be confirmed. Used by OMC or Host Software to acknowledge alarms.

4.10.5 Alarms				
Designation	**Abbrv.**	**Format**	**Description**	**Comments**
Valid Login	VLI	CCCCCCCC	max. 8 characters	user-ID (logged in) no reply to this alarm
Log out	LGO	CCCCCCCC	max. 8 characters	user-ID (logged out) no reply to this alarm
Changes via LMT or remote login	CLR			indicates that changes have been made by personnel via LMT or remote login. This alarm is sent only when changes are made.
Invalid login attempts	ILI	CCCCCCCC	max. 8 characters	number of unsuccessful login attempts above the limit imposed by ILA.

5 TEST DATA SHEET

CI Wireless Inc. **MirrorCell® Cellular Band Channel Selective CDMA Repeater**	**Effectivity: 08/23/99**	**TDS—XXXXXX Rev.X1**
WRITTEN BY: LK	**UNIT S/N: _____**	**DATE: _____**
MODEL #: CDR-801	**ONE CHANNEL REPEATER**	**OPERATOR: _____**

TEST TITLE	**SPECS**		**MEASUREMENT**						
			CHN#: 1013		**CHN#: 384**		**CHN#: 777**		
	Max	**Min**	**Rev Link**	**Frward Link**	**Rev Link**	**Frward Link**	**Rev Link**	**Frward Link**	
FREQUENCY	**---**	**---**	**824.70**	**869.70**	**836.52**	**881.52**	**848.31**	**893.31**	**MHz**
Gain (0 dB Attenuation)	**97**	**93**							**dB**
Gain Change @ 10 dB Attenuation (resp. to max)	**11**	**9**							**dB**
Gain Change @ 20 dB Attenuation (resp. to max)	**21**	**19**							**dB**
Gain Change @ 30 dB Attenuation (resp. to max)	**31**	**29**							**dB**
Frequency Flatness @ 1.23 MHz BW	**2.5**	**---**							**dB**
Spectral Regrowth @ Max Gain DL Pout: 40dBm (± 750KHz Offset) UL Pout: 27dBm (± 880KHz Offset) Measure @ 30 KHz RBW	**-45 DL -42 UL**	**---**							**dBc**
Spectral Regrowth @ Max Gain DL Pout: 40dBm; UL Pout: 27dBm Measure @ ± 1.98 MHz Offset, 30 KHz RBW	**-60 DL -54 UL**	**---**							**dBc**
Spectral Regrowth @ Min Gain DL Pout: 40dBm (± 750KHz Offset) UL Pout: 24dBm (± 880KHz Offset) Measure @ 30 KHz RBW	**-45 DL -42 UL**	**---**							**dBc**
Spectral Regrowth @ Min Gain DL Pout: 40dBm; UL Pout: 24dBm Measure @ ± 1.98 MHz Offset, 30 KHz RBW	**-60 DL -54 UL**	**---**							**dBc**
Noise Figure @ Max Gain	**5**								**dB**
Noise Figure @ Min Gain	**5**								**dB**
Output Power Peak Limit	**40.5 DL 27.5 UL**	**39.5 DL 26.5 UL**							**dBm**
Donor/Server Test Port Coupling	**-27**	**-33**							**dBc**

CI Wireless Inc. **MirrorCell® Cellular Band Channel Selective CDMA Repeater**	**Effectivity: 08/23/99**	**TDS—XXXXXX Rev.X1** **TEST DATA SHEET Page 1 of 2**
WRITTEN BY: LK	**UNIT S/N: _____**	**DATE: _____**
MODEL #: CDR-812 (Option –737)	**TWO CHANNEL REPEATER**	**OPERATOR: _____**

TEST TITLE	**SPECS**		**CHANNEL ONE MEASUREMENT**						
			CHN#: 1013		**CHN#: 439**		**CHN#: 654**		
	Max	**Min**	**Rev Link**	**Frward Link**	**Rev Link**	**Frward Link**	**Rev Link**	**Frward Link**	
FREQUENCY	**---**	**---**	**824.70**	**869.70**	**838.17**	**883.17**	**844.62**	**889.62**	**MHz**
Gain (0 dB Attenuation)	**97**	**93**							**dB**
Gain Change @ 10 dB Attenuation (resp. to max)	**11**	**9**							**dB**
Gain Change @ 20 dB Attenuation (resp. to max)	**21**	**19**							**dB**
Gain Change @ 30 dB Attenuation (resp. to max)	**31**	**29**							**dB**
Frequency Flatness @ 1.23 MHz BW	**2.5**	**---**							**dB**
Spectral Regrowth @ Max Gain DL Pout: 37dBm (± 750KHz Offset) UL Pout: 24dBm (± 880KHz Offset) Measure @ 30 KHz RBW	**-45 DL -42 UL**	**---**							**dBc**
Spectral Regrowth @ Max Gain DL Pout: 37dBm; UL Pout: 24dBm Measure @ ± 1.98 MHz Offset, 30 KHz RBW	**-60 DL -54 UL**	**---**							**dBc**
Spectral Regrowth @ Min Gain DL Pout: 37dBm (± 750KHz Offset) UL Pout: 21dBm (± 880KHz Offset) Measure @ 30 KHz RBW	**-45 DL -42 UL**	**---**							**dBc**
Spectral Regrowth @ Min Gain DL Pout: 37dBm; UL Pout: 21dBm Measure @ ± 1.98 MHz Offset, 30 KHz RBW	**-60 DL -54 UL**	**---**							**dBc**
Noise Figure @ Max Gain	**5**	**---**							**dB**
Noise Figure @ Min Gain	**5**	**---**							**dB**
Output Power Peak Limit	**37.5 DL 24.5 UL**	**36.5 DL 23.5 UL**							**dBm**
Donor/Server Test Port Coupling	**-27**	**-33**							**dBc**

*** Perform the Spectral Regrowth & Output Power Peak limiting measurements with both channels present.**

CI Wireless Inc. **MirrorCell® Cellular Band Channel Selective CDMA Repeater**	**Effectivity: 08/23/99**	**TDS—XXXXXX Rev.X1** **TEST DATA SHEET Page 2 of 2**
WRITTEN BY: LK	**UNIT S/N: _____**	**DATE: _____**
MODEL #: CDR-812 (Option – 737)	**TWO CHANNEL REPEATER**	**OPERATOR: _____**

TEST TITLE	**SPECS**		**CHANNEL TWO MEASUREMENT**						
			CHN#: 113		**CHN#: 562**		**CHN#: 777**		
	Max	**Min**	**Rev Link**	**Frward Link**	**Rev Link**	**Frward Link**	**Rev Link**	**Frward Link**	
FREQUENCY	**---**	**---**	**828.39**	**873.39**	**841.86**	**886.86**	**848.31**	**893.31**	**MHz**
Gain (0 dB Attenuation)	**97**	**93**							**dB**
Gain Change @ 10 dB Attenuation (resp. to max)	**11**	**9**							**dB**
Gain Change @ 20 dB Attenuation (resp. to max)	**21**	**19**							**dB**
Gain Change @ 30 dB Attenuation (resp. to max)	**31**	**29**							**dB**
Frequency Flatness @ 1.23 MHz BW	**2.5**	**---**							**dB**
Spectral Regrowth @ Max Gain DL Pout: 37dBm (± 750KHz Offset) UL Pout: 24dBm (± 880KHz Offset) Measure @ 30 KHz RBW	**-45 DL -42 UL**	**---**							**dBc**
Spectral Regrowth @ Max Gain DL Pout: 37dBm; UL Pout: 24dBm Measure @ ± 1.98 MHz Offset, 30 KHz RBW	**-60 DL -54 UL**	**---**							**dBc**
Spectral Regrowth @ Min Gain DL Pout: 37dBm (± 750KHz Offset) UL Pout: 21dBm (± 880KHz Offset) Measure @ 30 KHz RBW	**-45 DL -42 UL**	**---**							**dBc**
Spectral Regrowth @ Min Gain DL Pout: 37dBm; UL Pout: 21dBm Measure @ ± 1.98 MHz Offset, 30 KHz RBW	**-60 DL -54 UL**	**---**							**dBc**
Noise Figure @ Max Gain	**5**	**---**							**dB**
Noise Figure @ Min Gain	**5**	**---**							**dB**
Output Power Peak Limit	**37.5 DL 24.5 UL**	**36.5 DL 23.5 UL**							**dBm**
Donor/Server Test Port Coupling	**-27**	**-33**							**dBc**

*** Perform the Spectral Regrowth & Output Power Peak limiting measurements with both channels present.**

6 RELEASE AND REVISION RECORD

RELEASE AND REVISION RECORD				
Rev	**ECR**	**Description**	**Date Approved**	**Approved by**
X1		**New Release to X-Level Specifications**		