

Mini 200mW User's Manual

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RF Repeater

Band Selective Type

Sprint PCS

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Revision History

Version	Date of revision	Reason for revision	Revision Description
Ver 0.1	August 11, 2005		

RF EXPOSURE INFORMATION

The antenna used for this transmitter must not exceed 12dBi and must be installed to provide a minimum separation distance of 20cm from all persons.

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1. Overview

Mini 200 will bring in those weak cellular phone signals reducing dropped calls and allowing you to use cell phones ...even deep inside a building.

At the heart of all of our systems is a Mini 200 designed to improve coverage for wireless products within a facility. Combined with interior ceiling mounted low profile antennas, and an exterior mounted Yagi or Patch Antenna, the Mini 200 boosts the signal level for distribution within the interior areas, reducing the problem of dropped calls and signal fades. The Mini 200 can also be used in mobile applications, improving voice quality and range in areas of poor coverage.

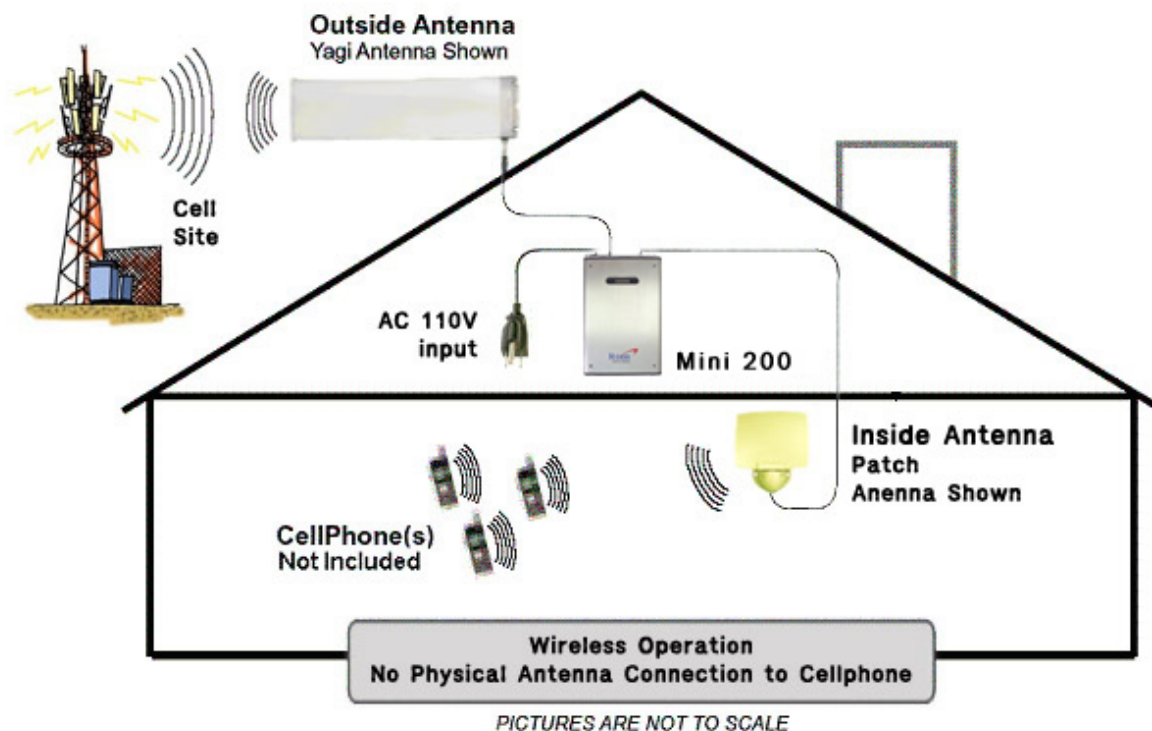


Figure 2.1 Fundamental configuration of **Mini 200**

All of our packages are engineered using only FCC approved amplified components. They are designed not to disrupt local wireless communication but to add service to areas that otherwise would not have the coverage that the customer requires. All of Mini 200 is easily installed.

2. Repeater Design

The Mini 200 is housed in an aluminum chassis that is waterproof for indoor use. The chassis has a design suited for indoor use.

The Mini 200 has several RF amplifiers and components on a board with an aluminum body. Furthermore, the RF components are implemented within RF CMOS IC or MMIC technologies. A board that contains several RF amplifiers and components is shielded under a metal cover. This amplifier board is different types depending on the supported system.

The followings are the Technical Specification of Mini 200,

2.1 System specification

2.1.1 Mechanical and Environmental conditions

Parameter	Specification
Power supply	AC 120V +30/20%(AC 96~156V), 50/60Hz ±5%
Operating temperature	0 ~ +45℃
Humidity	10% ~ 85%
Consumption power	159W
RF connector	N-female
Size(W X L X H)	280 X 430 X 115 (mm) / 11.02 X 16.93 X 4.53 (inch)
Weight	Less than 33 lbs

Table 2-1. Mechanical & Environmental Conditions

2.1.2 Electrical Specification

A. Mini 200 Repeater

Parameter		Specification	Remark
Frequency Band	Down Link	1930 – 1970 MHz	Total 40 MHz
	Up Link	1850 – 1880 MHz	Total 40 MHz
Transmit Maximum Power	Down Link	+ 23 dBm (200mW)	Total Power on CDMA
	Up Link		
Gain		80 dB ± 1dB	
Gain Range		70 ~ 80dB	
Gain Step		10 dB (1 dB Step)	
Noise Figure		< 5 dB	
Bandwidth(Type 1)		5 MHz BW(Max. 3FA)	Any 5MHz of Total 60MHz (A1,A2,A3,D,B1,B2,B3,E,F,C1,C2,C3)
Bandwidth(Type 2)		10 MHz BW(Max. 7FA)	Any 10MHz of Total 60MHz (A1A2,A2A3,A3D,DB1,B1B2,B2B3, B3E,EF,FC1,C1C2,C2C3)
Bandwidth(Type 3)		15 MHz BW(Max. 7FA)	Any 15MHz of Total 60MHz (A,A2A3D,A3DB1,DB1B2,B,B2B3E, B3EF,EFC1,FC1C2,C)
Bandwidth(Type 4)		20 MHz BW(Max. 7FA)	Any 20MHz of Total 60MHz (AD,A2A3DB1,A3DB1B2,DB,BE,B2 B3EF,B3EFC1,EFC1C2,FC1C2C3)
Passband Ripple		≤ 2.5 dB P-P	Operating Bandwidth
Delay		< 12 microseconds	
VSWR		≤1.5	
In-band Noise		$F_c \pm 885\text{kHz} \geq -45 \text{ dBc}$	RBW = 30 kHz
		$F_c \pm 1.98\text{MHz} \geq -50 \text{ dBc}$	RBW = 30 kHz
Spurious Emissions		< -13 dBm ($F_c \pm 2.25 \text{ MHz}$)	RBW = 1 MHz

Table 2-2. Repeater Features

B. Mini 200 Antenna

Parameter		Specification		
		Donor	Distribution	
		Yagi	Patch	Omni(Optical)
Frequency range		1850 ~ 1990MHz		
Frequency bandwidth		140MHz		
Antenna gain		Min. 12dBi	2dBi	2dBi
Beam width	Horizontal	Min. 28°	70°	360°
	Vertical	Min. 28°	70°	70°
Polarization		Vertical		
VSWR		Max. 1: 1.5	Max. 1 : 1.3	Max. 1 : 1.5
Power Capability		50Watts	10Watts	10Watts
Antenna Connector Port Type		N-Female	N-Female	N-Female
Weight (g / lbs)		670 / 1.48	225 / 0.5	270 / 0.6
Dimension (W x H x D) (inch)		19.69 x 4.21 x 3.23	5.04 x 4.06 x 1.54	Φ 4.49 x 1.85
Impedance		50 Ω		

Table 2-3 Antenna Features

3. Repeater Configurations

The Mini 200 consists largely of a body and an antenna. The body of the Mini 200 has an RF unit, a main control unit and a power supply unit. Specifically, the antenna unit is separated as a donor antenna and distribution antenna.

3.1 Body

The following is the picture of the body of Mini 200.



Figure 3.1 A body of the Mini 200

3.1.1 RF Unit

The RF Unit significantly functions an RF amplifier to amplify the weaken transmitted signal from a base station.

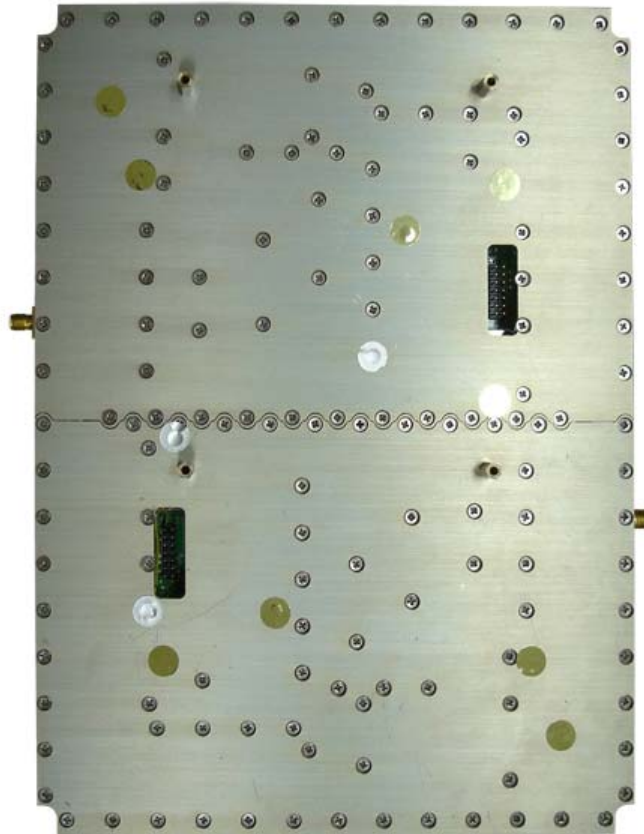


Figure 3.2 An RF Unit of the Mini 200.

3.1.2 Main Control Unit (MCU)

The ARCU board is the control unit of the repeater. The ARCU board is used to supervise and control operational parameters such as gain control, ALC handling, etc. The ARCU takes care of alarms and the event log, password and logon, and many other procedures.

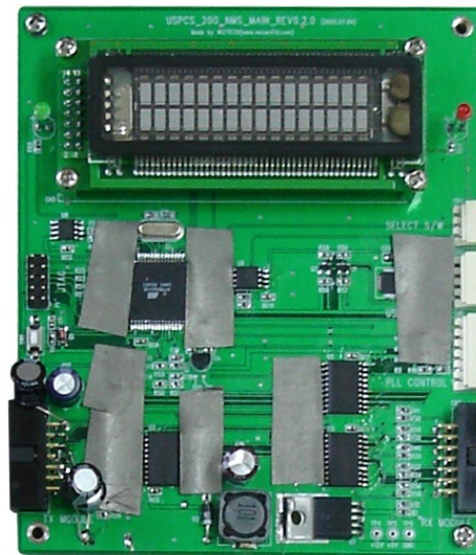


Figure 3.3 A Main control unit of the Mini 200.

3.1.3 Power Supply Unit (PSU)

The Power Supply Unit (PSU) roles in each needed dc power source as well as converter of ac power to dc power.



Figure 3.4 Power supply unit of Mini 200.

3.2 Antenna Unit

The Mini 200 has two antennas, a donor antenna and a distribution antenna, to provide a good communication service.

3.2.1 Donor Antenna (Yagi Antenna)

A donor antenna is used for receiving the transmitted signal from a base station.



Figure 3.5 A Yagi antenna (Donor antenna)

3.2.2 Distribution Antenna

A distribution antenna serves to transmit the amplified signal to individual mobile station in the shaded area.

A. Patch Antenna



Figure 3.6 a Patch Antenna (Distribution Antenna)

B. Omni Antenna (Optional)



Figure 3.7 An Omni Antenna (Distribution Antenna)

4. Block Diagram

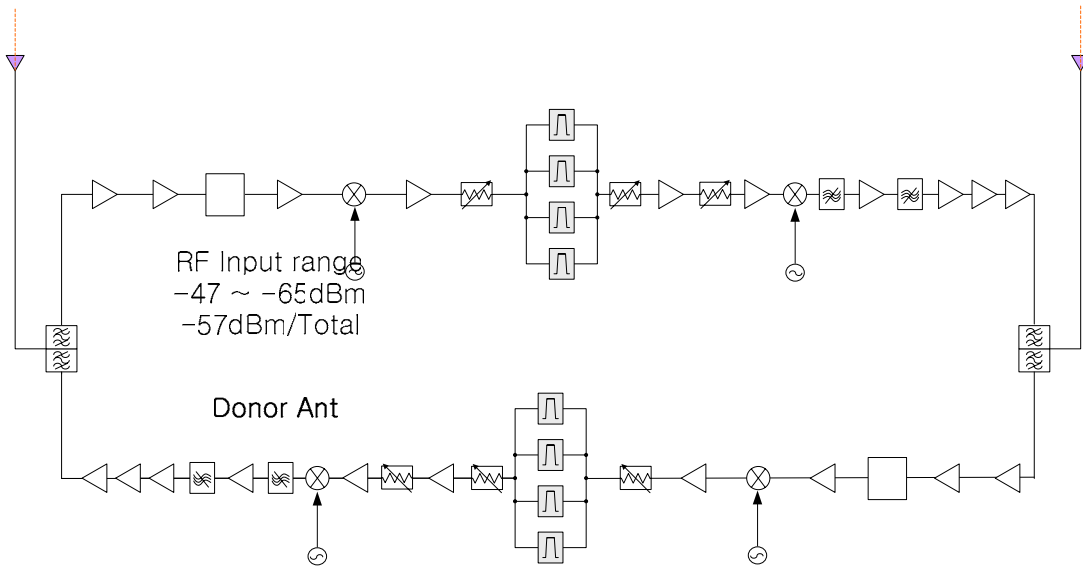


Figure 4.1 The block diagram of a band selective repeater

Figure 4.1 shows the block diagram of a band selective repeater. This diagram is applicable to repeaters for CDMA systems.

4.1 Downlink signal path

PLL:Variable

The downlink signal path, i.e. from the base station through the repeater to the mobile station, is described for Mini 200 in the above block diagrams.

Duplexer

4.2 Uplink signal path

The uplink signal path, i.e. from the mobile station through the repeater to the base station, is identical to the downlink path but the other way round. Only some levels and component values differ.

Attenuator Attenuator

PLL:Variable

Mini 200 Repeater System User's Manual

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