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EMII-800 User Manual
Application Information

EMII-800-V1.0
February 15, 2002

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Introduction

The EMII-800 is designed for the test and simulation of the CDMA wireless data communications. User can connect the EMII-800 to your PC or Notebook and easily test the wireless communications. User can use this to develop your applications software even before user's own hardware is ready. It also can be used as a debugging during user's hardware test.

Disclaimer and Limitation of Liability

AnyDATA.NET Inc. assumes no responsibility for any damage or loss resulting from the misuse of its products. AnyDATA.NET Inc. assumes no responsibility for any loss or claims by third parties, which may arise through the use of its products.
AnyDATA.NET Inc. assumes no responsibility for any damage or loss caused by the deletion or loss of data as a result of malfunctions or repairs.

FCC RF Exposure Information

Warning! Read this information before using this device.

In August 1996 the Federal Communications Commission (FCC) of the United States with its action in Report and Order FCC 96-326 adopted an updated safety standard for human exposure to radio frequency electromagnetic energy emitted by FCC regulated transmitters. Those guidelines are consistent with the safety standard previously set by both U.S. and international standards bodies. The design of this device complies with the FCC guidelines and these international standards.

CAUTION

Operating Requirements

- The user can not make any changes or modifications not expressly approved by the party responsible for compliance, otherwise it could void the user's authority to operate the equipment.
- To satisfy FCC RF exposure compliance requirements for a mobile transmitting device, this device and its antenna should generally maintain a separation distance of 20cm or more from a person's body.

Special accessories

In order to ensure this device in compliance with FCC regulation, the special accessories are provided with this device and must be used with the device only. The user is not allowed to use any other accessories than the special accessories given with this device

Contents

1. Introduction

1.1 Purpose

This Manual provides hardware interface and programming information for EMII-800 CDMA Wireless Data Modem.

1.2 Organization

The interface and operation section is organized into the following subsections:

- Section 2 – Introduces users to the EMII-800 CDMA Wireless Data Modem basic features and general specifications.
- Section 3 – Contains EMII-800 Pin description - DC12V Input Port, 8pin Serial Port and Debugging Port.
- Section 4 – Describes the UART Interface.
- Section 5 – Specifies the recommended operating conditions, DC voltage characteristics, I/O timing, and power estimations for the modem.
- Section 6 – Provides package dimensions and outlook features for the modem.
- Section 7 – Describes the FCC Notice.

1.3 Revision History

The revision history for this document is shown in Table 1-1.

Table 1-1 Revision History

Version	Date	Description
V1.0	Feb. 2002	Initial Release

2. Overview

2.1 Application Descriptions

The CDMA Wireless Data Modem is a complex consumer communications instrument that relies heavily on both digital signal and embedded processor technologies. The Wireless Data Modem manufactured by AnyDATA.NET supports Code-Division-Multiple-Access(CDMA). This operates in PCS spectrum.

In a continuing effort to simplify the design and to reduce the production cost of the Wireless Data Modem, AnyDATA.NET has successfully developed the EMII-800. The EMII-800 is AnyDATA.NET's latest compact Wireless Data Modem operating in PCS spectrum, also contains complete digital modulation and demodulation system for CDMA standards as specified in IS-95 A/B and IS-2000.

The subsystem within the EMII-800 includes a CDMA processor (MSM5100), an integrated CODEC with an ear piece and microphone amplifiers, and an RS-232 serial interface supporting forward link data communications of a rate of 153.6kbps.

The EMII-800 provides external interface. External interface includes the standard RS-232, Digital Audio, and External On/Off control.

The EMII-800 has the capability to power down unused circuits in order to dynamically minimize power consumption.

2.2 Technical Specifications

2.2.1 General Specifications

PARAMETERS	DESCRIPTIONS
External Access	Code-Division-Multiple-Access (CDMA)
CDMA Protocol	IS-95A/B/C, IS-98A, IS-126, IS-637A, IS-707A
Data Rate	153.6Kbps
Transmit/Receive Frequency Interval	45MHz
Band Width	1.23MHz
Operating Voltage	DC 6V ~ 12V
Current Consumption	Stand by mode : Idle (55mA) , Busy mode : 280mA (Max) at 12V
Operating Temperature	-30℃ ~ +60℃
Frequency Stability	±300Hz
Antenna	Whip Antenna, 50ohm
Size	57 X 121 X 24mm with case
Weight	About 112g
External Interface	RS-232, Digital/Analog Audio, LCD, Keypad, Ringer External On/Off Control

2.2.2 Receive Specifications

PARAMETERS	DESCRIPTIONS
Frequency Range	869.04 ~ 893.97 MHz
Sensitivity	Below –104 dBm
Interference Rejection	Single tone (-30dBm @900KHz) : Below –101dBm Two tone (-43 dBm @900KHz and 1700KHz) : Below –101dBm Two tone (-32 dBm @900KHz and 1700KHz) : Below –90dBm Two tone (-21 dBm @900KHz and 1700KHz) : Below –79dBm
Spurious Wave Suppression	Below –80dBc
Input Dynamic Range	-25 dBm ~ -104dBm

2.2.3 Transmit Specifications

PARAMETERS	DESCRIPTIONS
Frequency Range	824.04 ~ 848.97 MHz
Nominal Power	0.32 W
Minimum Controlled Output Power	Below –50dBm
Max Power Spurious	Below –42dBc/30KHz @ 900KHz Below –54dBc/30KHz @ 1.98MHz

2.2.4 Standards

IS-95A/B/C : Protocol Between MS & BTS
IS-96A : Voice Signal Coding
IS-98A : Base MS Function
IS-126 : Voice Loop-Back
IS-637 : Short Message Service
IS-707 : Data Service

2.3 Interface Diagram

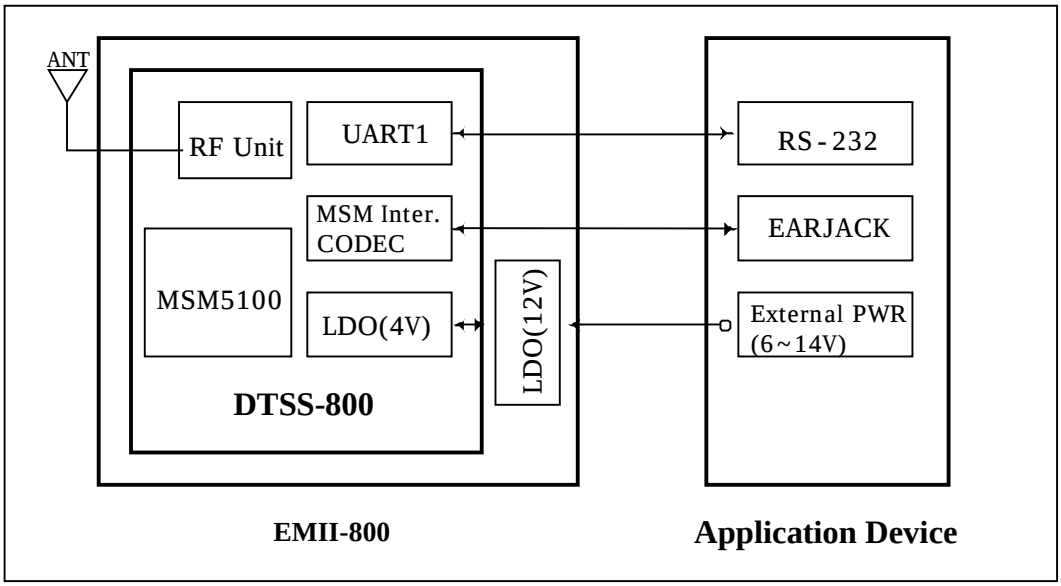


Figure 2-1 Interface Block Diagram

2.4 EMII-800 General Features

Figure 2-2 EMII-800General Features

2.5 Internal Modem Features

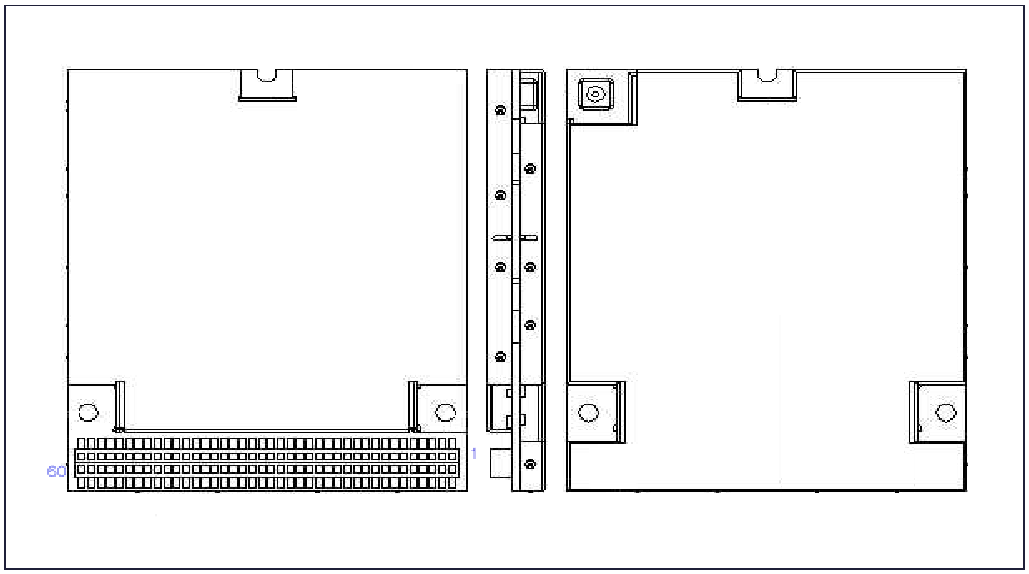


Figure 2-3 Internal Modem General Features (DTSS-800)

3. PIN Description

3.1 8-Pin Male Modular Jacks(RS232 Standard)

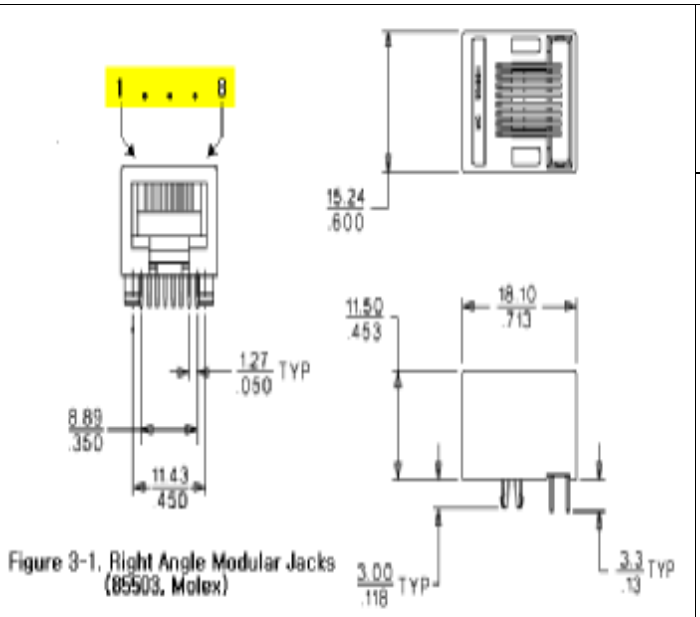


Figure 3-1. Right Angle Modular Jacks (85503, Molex)

Molex (85503)	RS-232
Pin 1	RI
Pin 2	GND
Pin 3	DTR
Pin 4	CTS
Pin 5	TX
Pin 6	RTS
Pin 7	RX
Pin 8	DCD

Figure 3-1 Right Angle Modular Jacks Pin Description (85503,Molex 8P)

3.2 3-Pin Connector (Debugging)

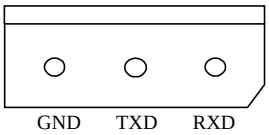


Figure 3-2 Debugging Connector (5268,Molex 3P)

3.3 DC Power Connector

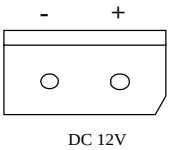


Figure 3-3 DC 12V Power Connector (5268, Molex 2P)

4. Interface Descriptions

4.1 Overview

This chapter covers information required to design the EMII-800 into a subscriber unit application. In addition, the internal signals that are necessary for complete understanding of the UART interfaces are described below.

4.2 RS232 Interface (Standard)

The Universal Asynchronous Receiver Transmitter (UART) communicates with serial data that conforms the RS-232 Interface protocol. The modem provides 3.0V CMOS level outputs and 3.0V CMOS switching input level. And all inputs have 5.0V tolerance but 3.0V or 3.3VCMOS logic compatible signals are highly recommended.

All the control signals of the RS-232 signals are active low, but data signals of RXD, and TXD Are active high. The UART has a 64byte transmit (TX) FIFO and a 64byte receive (RX) FIFO. The UART Features hardware handshaking, programmable data sizes, programmable stop bits, and odd, even, no parity. The UART operates at a 115.2kbps maximum bit rate.

NAME	DESCRIPTION	CHARACTERISTIC
DP_DCD/	Data Carrier Detect	Network connected from the modem
DP_RI/	Ring Indicator	Output to host indicating coming call
DP_RTS/	Request to Send	Ready for receive from host
DP_TXD	Transmit Data	Output data from the modem
DP_DTR/	Data Terminal Ready	Host ready signal
DP_RXD	Receive Data	Input data to the modem
DP_CTS/	Clear to Send	Modem output signal
GND	Signal Ground	Signal ground

Figure 4-1 UART Interface Pinouts

5. Electrical Specifications

5.1 Absolute Maximum Ratings

Operating the modem under conditions that exceed those listed in the Absolute Maximum. The Ratings table may result in damage to the modem.

Absolute Maximum Ratings may be considered as limiting values, and are considered individually. While all other parameters are within their specified operating ranges, the functional operation of the modem under any of the conditions in the Absolute Maximum Ratings table is not implied.

Table 5-1 Absolute Maximum Ratings

PARAMETER	MIN	MAX	UNITS
Storage Temperature	-40	+100	℃
Voltage On Any Input or Output Pin	-	+5.0	V
Supply Voltage	-	+15	V
Initializing Current	100		mA
Drop	No damages after 60-Inch drop over concrete floor		

5.2 Recommended Operating Conditions

PARAMETER	MIN	MAX	UNITS
Supply Voltage	6	12	V
Operating Temperature	-30	+60	℃
Operating Humidity	95%(50℃) Relative Humidity		

5.3 Power Consumption

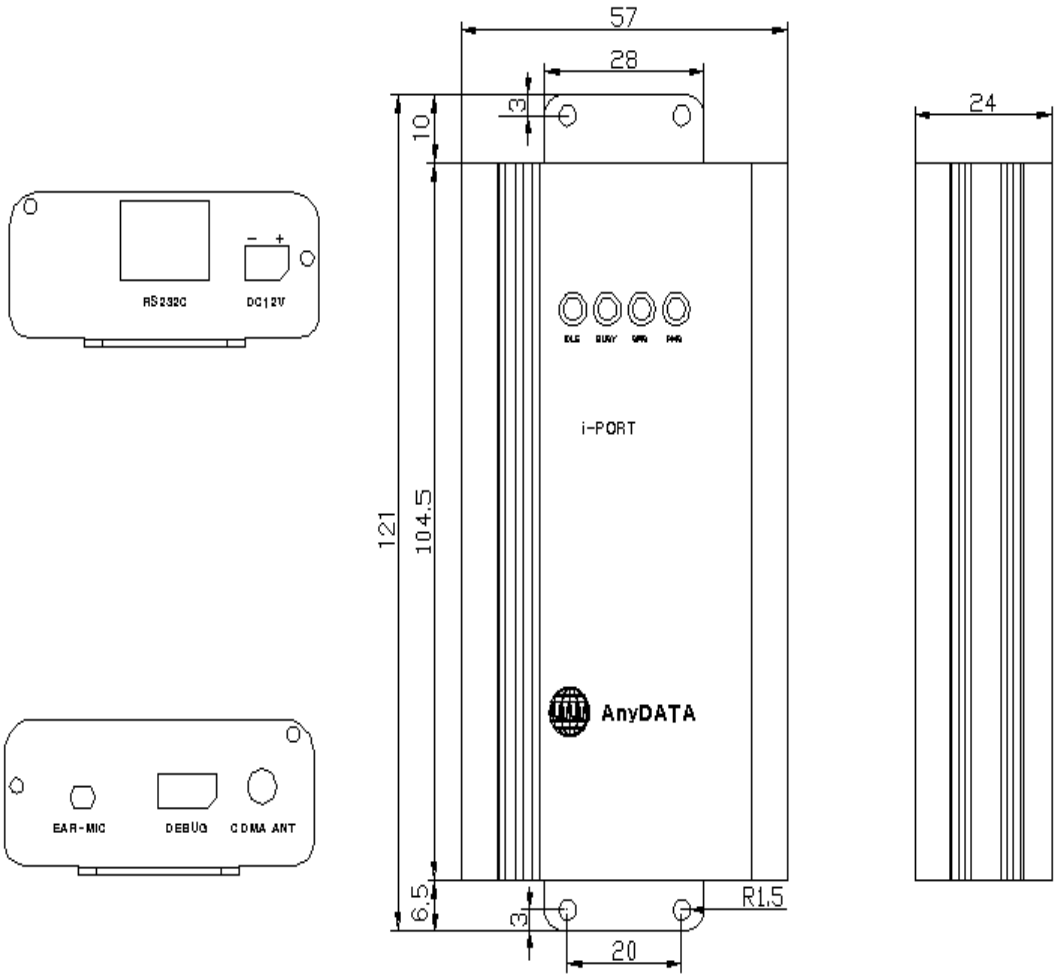
CONVERSATION	STANDBY	
	Idle	Sleep
280 mA (MAX)	55 mA	18 mA

5.4 Serial Interface Electrical Specifications

PARAMETER	MIN	MAX	UNITS
Input High Voltage	+2.0	+3.7	V
Input Low Voltage	-0.5	+0.8	V
Output High Voltage	+2.4		V
Output Low Voltage		+0.4	V

6. Mechanical Dimensions

6.1 EMII-800 Outline



7. FCC Notice

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.