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EMIV-DUAL User Manual
Application Information

01-EMIVDUAL-1_X1

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Introduction

The EMIV-DUAL is designed for the test and simulation of the CDMA wireless data communications. User can connect the EMIV-DUAL 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.

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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.**

▶ **Antenna Gain must not exceed 1dBi**

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 EMIV-DUAL CDMA Wireless Data Modem.

1.2 Organization

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

- Section 2 – Introduces users to the EMIV-DUAL CDMA Wireless Data Modem basic features and general specifications.
- Section 3 – Contains EMIV-DUAL 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
X1	June 2004	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 800MHz CDMA and 1900MHz 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 EMIV-DUAL. The EMIV-DUAL is AnyDATA.NET's latest compact Wireless Data Modem operating in 800MHz CDMA and 1900MHz 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 EMIV-DUAL includes a CDMA processor (MSM6050), 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 153kbps.

The EMIV-DUAL provides external interface. External interface includes the standard RS-232, Digital Audio, External reset control, parallel LCD Display, Keypad, Ringer extension ports and R-UIM for China market.

The EMIII-DUAL 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-95 A/B, IS-126, IS-637A, IS-707A, IS-2000
Data Rate	153.6Kbps
Transmit/Receive Frequency Interval	45MHz for Cellular and 80MHz for PCS
Band Width	1.23MHz
Operating Voltage	DC 7V ~ 16V
Current Consumption	Sleep mode : 30mA, Idle mode (70mA) , Traffic mode : 350mA (Max) at 12V
Operating Temperature	-30℃ ~ +60℃
Frequency Stability	±300Hz for 800MHz CDMA and ±150Hz for 1900MHz CDMA
Antenna	Magnet mount helical antenna, 50ohm, 1dBi Gain for 800MHz and 1900MHz, -4dBi for 1575MHz
Size	60 X 112 X 29mm
Weight	About 110g
External Interface	RS-232, Analog audio, Power, Antenna, Debug port

2.2.2 Receive Specifications

PARAMETERS	DESCRIPTIONS
Frequency Range	869.04 ~ 893.97 MHz for 800MHz CDMA and 1931.25 ~ 1988.75MHz for 1900MHz CDMA
Sensitivity	Below −104dBm
Interference Rejection	Single tone (-30dBm @900KHz): Below −101dBm for 800MHz Single tone (-30dBm @1250KHz): Below −101dBm for 1900MHz
Spurious Wave Suppression	Below −80dBc
Input Dynamic Range	-25dBm ~ -104dBm

2.2.3 Transmit Specifications

PARAMETERS	DESCRIPTIONS
Frequency Range	824.04 ~ 848.97 MHz for 800MHz CDMA and 1851.25 ~ 1908.75MHz for 1900MHz CDMA
Nominal Max. Power	0.32 W (24.7dBm)
Peak Power in Operation Mode	0.35W (25.5dBm)
Minimum Controlled Output Power	Below −50dBm
Max Power Spurious	900KHz: Below −42dBc/30KHz 1.98MHz: Below −54dBc/30KHz 1250KHz : Below −42dBc/30KHz 1.98MHz: Below −50dBc/30KHz

2.2.4 gpsOne Receiver Specifications

Parameters	Descriptions
Frequency Range	L1, 1575.42MHz
C/A Code	1.023MHz Chip Rate
Receiver Sensitivity	−152dBm

2.2.5 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
Built-in TCP/IP : AnyDATA proprietary software
IS-657 : packet data

2.3 Interface Diagram
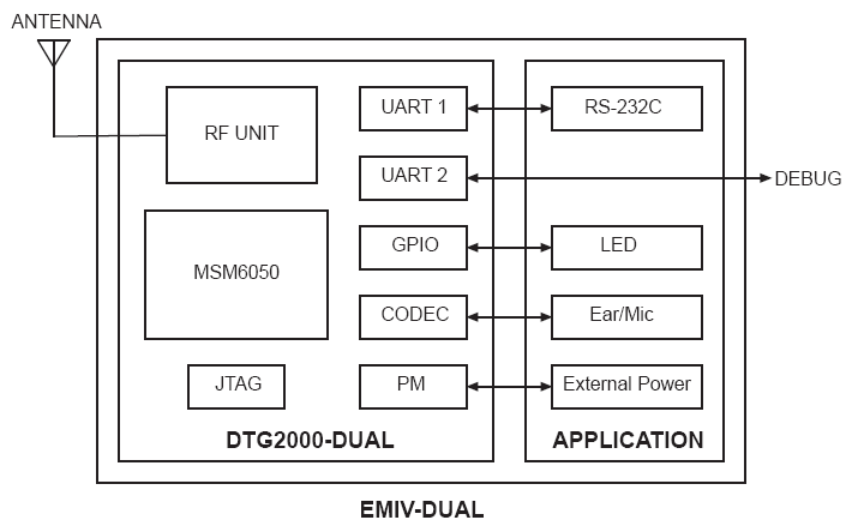
Figure 2-1 Interface Block Diagram

2.4 EMIV-DUAL General Features

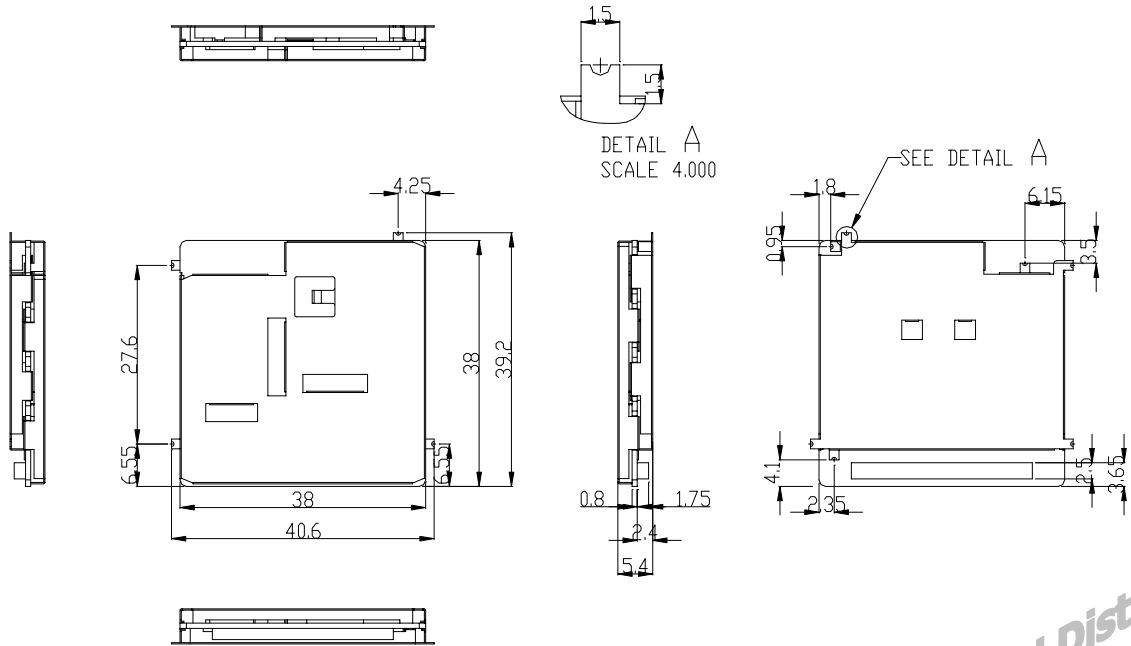**Figure 2-2 EMIV-DUAL General Features**

2.5 Internal Modem Features

Figure 2-3 Internal Modem General Features (DTG2000-D5XL)

3. PIN Description

3.1 8-Pin Male Modular Jacks (RS232 Standard)

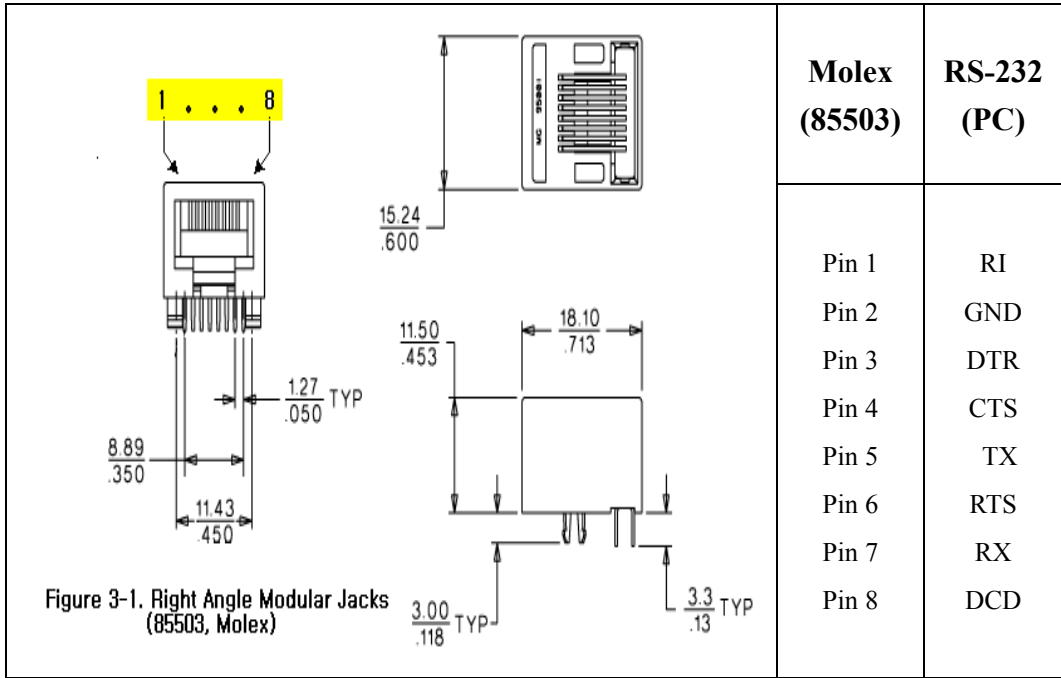| Molex (85503)	RS-232 (PC)
Pin 1	RI
Pin 2	GND
Pin 3	DTR
Pin 4	CTS
Pin 5	TX
Pin 6	RTS
Pin 7	RX
Pin 8	DCD

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

3.2 3-Pin Connector (Debugging)

GND   TXD   RXD
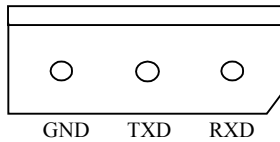
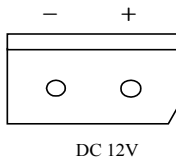**Figure 3-2   Debugging Connector (5268,Molex 3P)**

3.3 DC Power Connector

−   +

DC 12V

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

4. Interface Descriptions

4.1 Overview

This chapter covers information required to design the EMIV-DUAL 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 5.0V CMOS level.

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	+80	ºC
Voltage On Any Input	-	+20	V
Voltage On Any Output		+10	V
Supply Voltage	-	+20	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	+7	+16	V
Operating Temperature	-30	+60	ºC
Operating Humidity	95%(50ºC) Relative Humidity		

5.3 Power Consumption

Conversation	STANDBY	
	Idle	Sleep
350mA (MAX)	70mA	30mA

5.4 Serial Interface Electrical Specifications

PARAMETER	MIN	MAX	UNITS
Input High Voltage	+2	+15	V
Input Low Voltage	-15	-2	V
Output High Voltage	+5	+7	V
Output Low Voltage	-7	-5	V

6. Mechanical Dimensions

6.1 EMIV-DUAL Outline
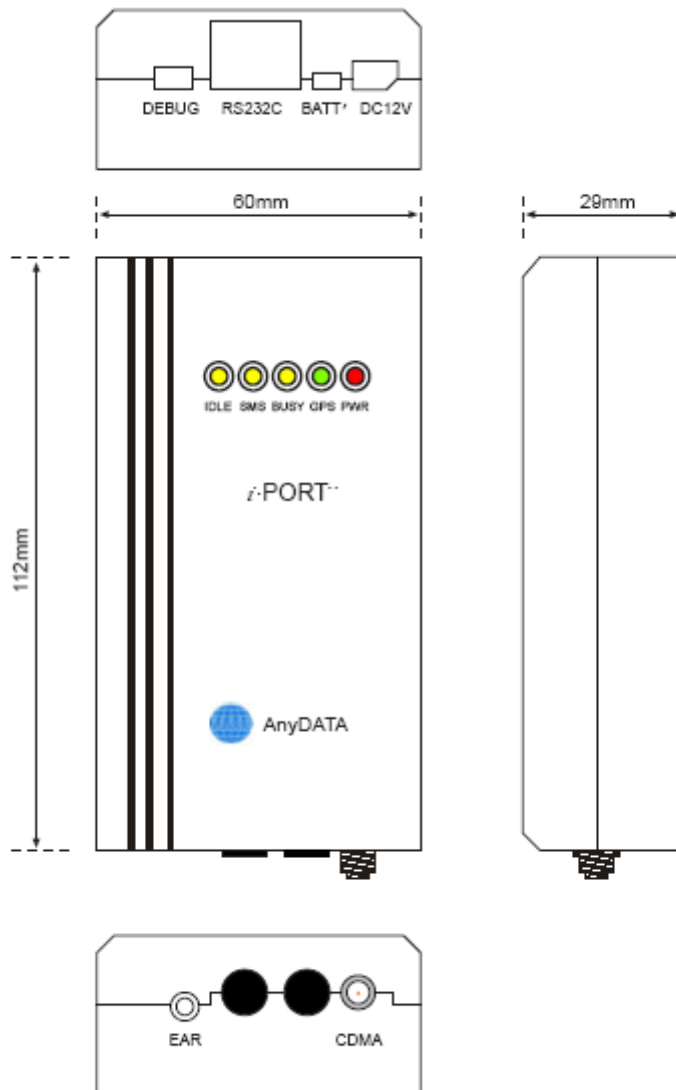
7. FCC Notice

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15, Part22 and Part24 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.

8. Installation Example