



AnyDATA
*AnyTime AnyPlace Any Wireless
Data Solutions*

*EMIII-DUAL User Manual
Application Information*

*EMIII-DUAL-V1.0
Feburary 15, 2002*

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EMIII-DUAL Reference Manual Application Information
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Introduction

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

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

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1. Introduction

1.1 Purpose

This Manual provides hardware interface and programming information for EMIII-DUAL CDMA Wireless Data Modem.

1.2 Organization

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

- n Section 2 – Introduces users to the EMIII-DUAL CDMA Wireless Data Modem basic features and general specifications.
- n Section 3 – Contains EMIII-DUAL Pin description - DC12V Input Port, 8pin Serial Port and Debugging Port.
- n Section 4 – Describes the UART Interface.
- n Section 5 – Specifies the recommended operating conditions, DC voltage characteristics, I/O timing, and power estimations for the modem.
- n Section 6 – Provides package dimensions and outlook features for the modem.
- n 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 EMIII-DUAL. The EMIII-DUAL 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 EMIII-DUAL 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 EMIII-DUAL provides external interface. External interface includes the standard RS-232, Digital Audio, and External On/Off control.

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-95A/B/C, IS-98A, IS-126, IS-637A, IS-707A |
| Data Rate | 153.6Kbps |
| Transmit/Receive Frequency Interval | CDMA : 45MHz, US_PCS : 80MHz |
| 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°C ~ +60°C |
| Frequency Stability | ±300Hz @ CDMA, ±150Hz @US_PCS |
| Antenna | Whip Antenna, 50ohm |
| Size | 57 X 121 X 24mm with case |
| Weight | About 110g |
| External Interface | RS-232, Digital/Analog Audio, LCD, Keypad, Ringer External On/Off Control |

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2.2.2 Receive Specifications

| PARAMETERS | DESCRIPTIONS |
|---------------------------|--|
| Frequency Range | CDMA :869.04 ~ 893.97 MHz , US_PCS:1931.25 ~ 1988.75 MHz |
| Sensitivity | Below -104 dBm |
| Interference Rejection | CDMA: 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 US_PCS :Single tone (-30dBm @1.25MHz) : Below -101dBm Two tone (-43 dBm @1.25MHz and 2.05MHz) : Below -101dBm |
| Spurious Wave Suppression | Below -80dBc |
| Input Dynamic Range | -25 dBm ~ -104dBm |

2.2.3 Transmit Specifications

| PARAMETERS | DESCRIPTIONS |
|---------------------------------|--|
| Frequency Range | CDMA :824.04 ~ 848.97 MHz , US_PCS:1851.25 ~ 1908.75 MHz |
| Nominal Power | 0.32 W |
| Minimum Controlled Output Power | Below -50dBm |
| Max Power Spurious | 900KHz : Below -42dBc/30KHz(CDMA Only) 1.98MHz : Below -54dBc/30KHz(CDMA, US_PCS) |

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

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2.3 Interface Diagram

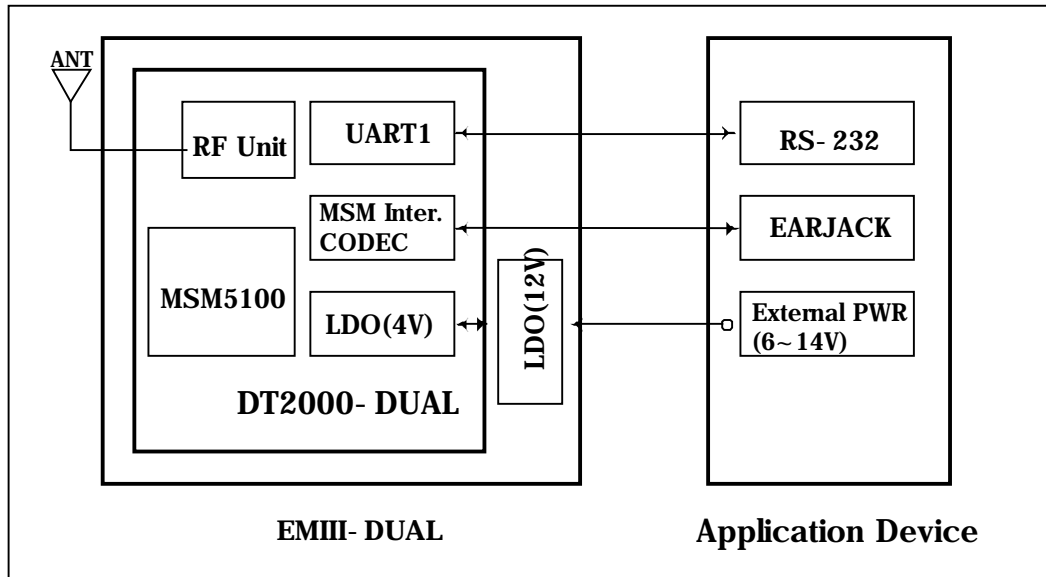


Figure 2-1 Interface Block Diagram

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2.4 EMIII-DUAL General Features



Figure 2-2 EMIII-DUAL General Features

2.5 Internal Modem Features

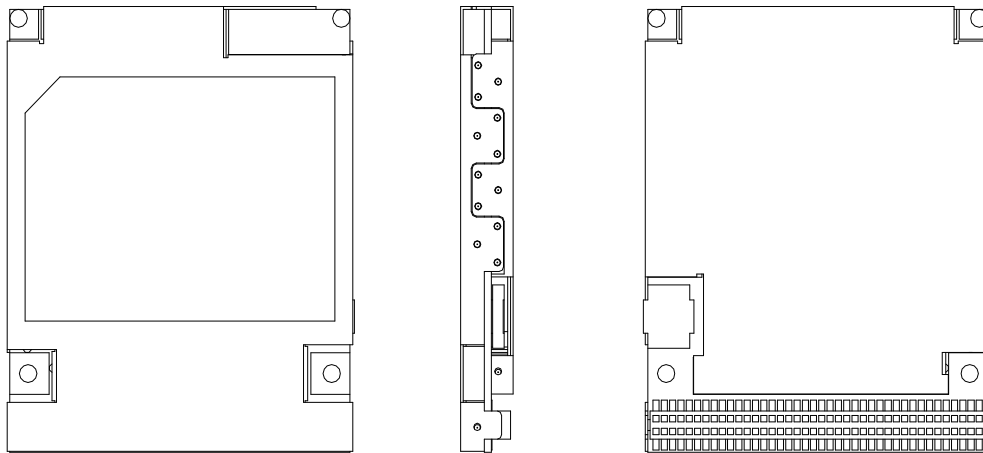


Figure 2-3 Internal Modem General Features (DT2000-DUAL)

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3. PIN Description

3.1 8-Pin Male Modular Jacks(RS232 Standard)

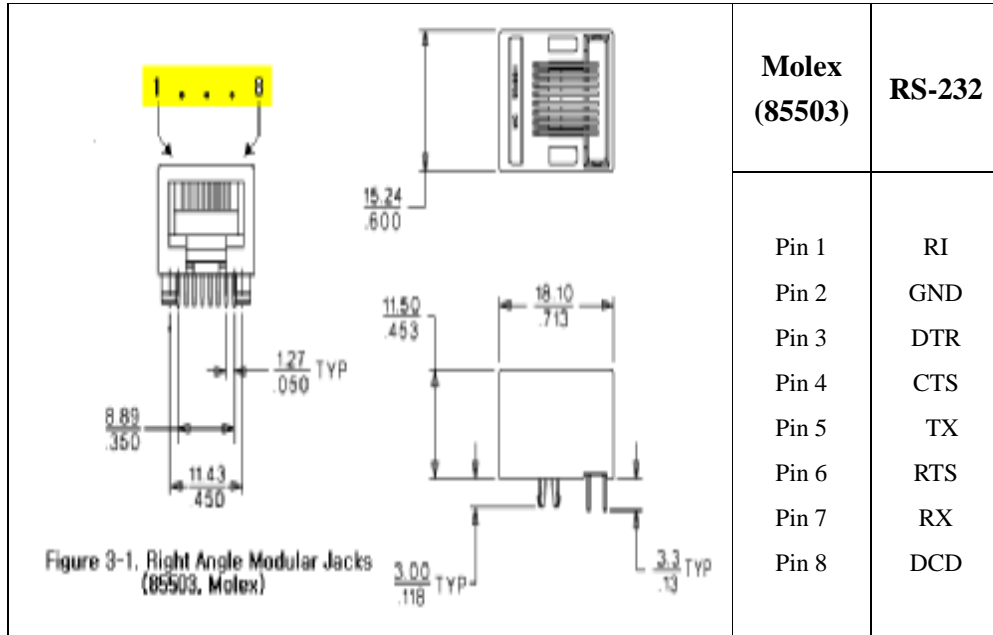


Figure 3-1 Right Angle Modular Jacks Pin Description (85503,Molex 8P)

3.2 3-Pin Connector (Debugging)

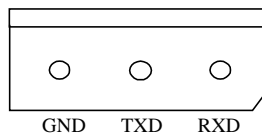


Figure 3-2 Debugging Connector (5268,Molex 3P)

3.3 DC Power Connector

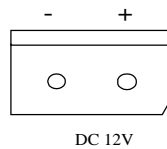


Figure 3-3 DC 12V Power Connector (5268, Molex 2P)

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4. Interface Descriptions

4.1 Overview

This chapter covers information required to design the EMIII-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 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

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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 | °C |
| 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 | °C |
| Operating Humidity | 95%(50°C) Relative Humidity | | |

5.3 Power Consumption

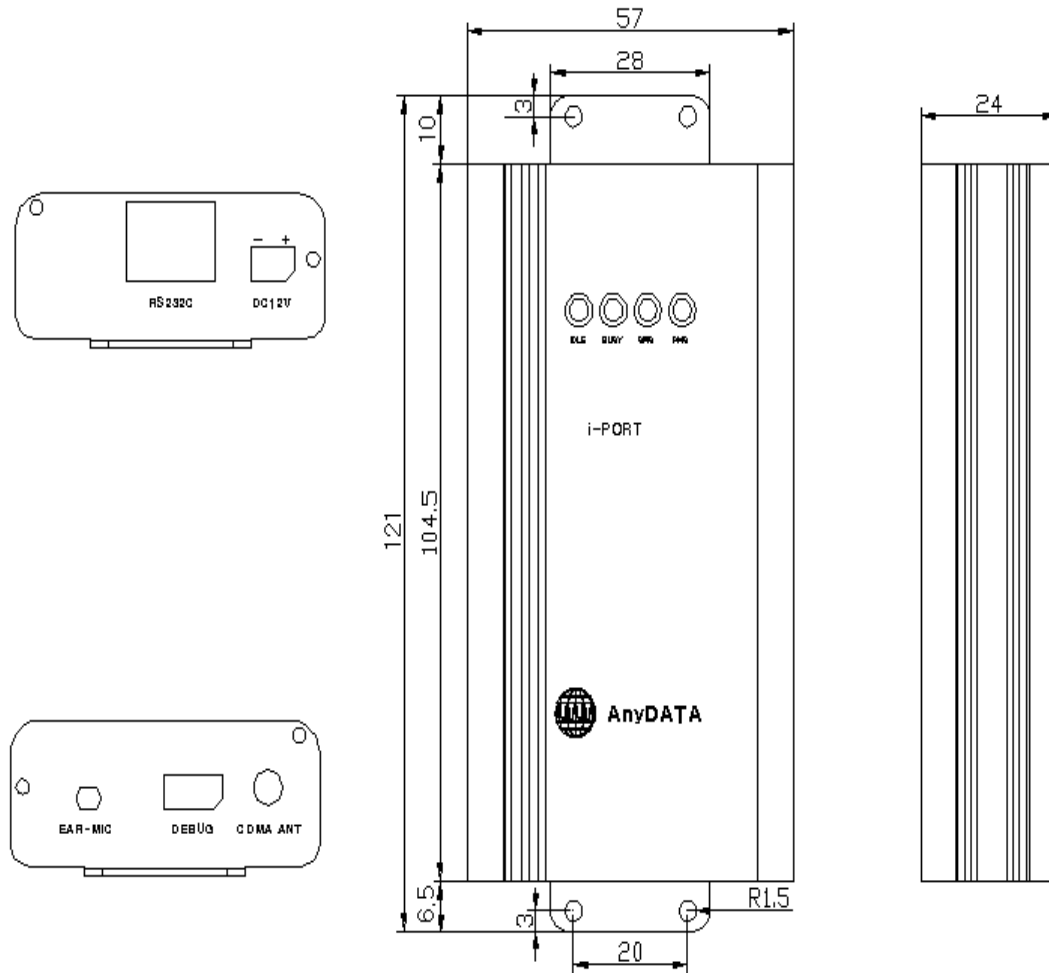
| CONVERSATION | STANDBY | |
|--------------|---------|-------|
| | Idle | Sleep |
| 280 mA (MAX) | 55 mA | 18 mA |

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 EMIII-DUAL Outline



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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:

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

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