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RoBoard RB-110 Manual V1.00

The Heart of Robotics

Mar 2010
DMP Electronics Inc

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Trademarks Acknowledgment

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Chapter 1

Introduction

1.1 Packing List

Product Name	Package
RB-100	RoBoard RB-10
	
Cable-RB-100	Power connector cable x 2 COM port cable x 4 (4 Pin) COM port cable x 1 (10 Pin) I²C cable x 1 LAN cable x 1 2x5 pin Cable x 1
	

1.2 Product Description

The RoBoard is the heart of any Robotic system making your Robby more active and intelligent. It does not just offer control but is a complete computer system based on the Vortex86DX CPU, a 32bit x86 CPU running at 1000MHz with 256MB RAM.

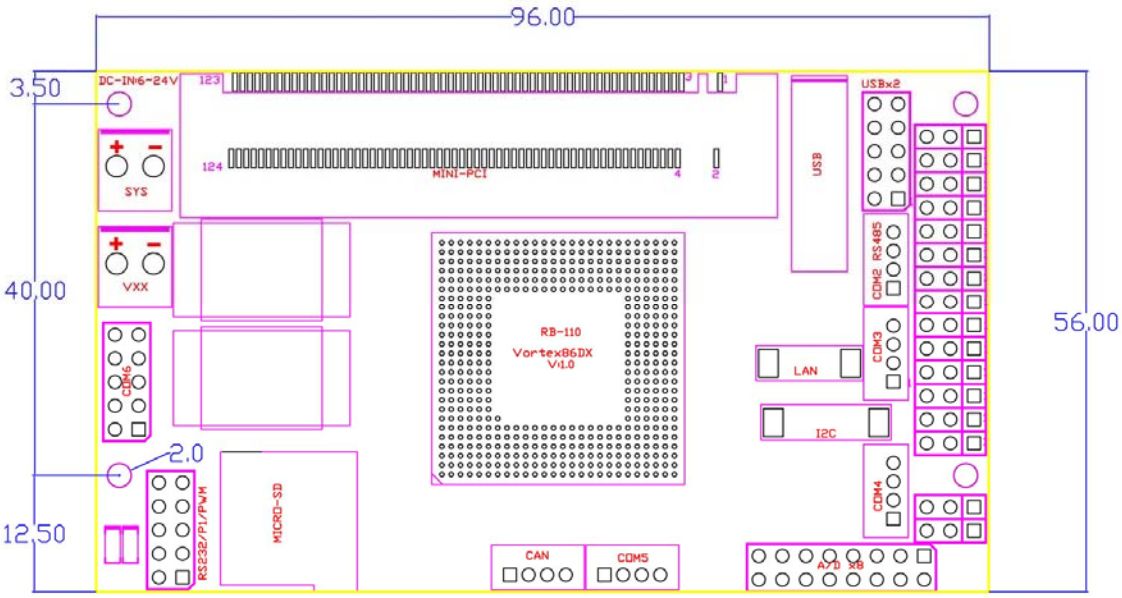
The RoBoard allows users to install a Windows or Linux Operating System onto a bootable Micro-SD card offering engineers a common storage media to develop with. The RoHS compliant CPU board measures just 96mm x 50mm and accepts a voltage input range from 6V-24V DC whilst providing extremely low power consumption.

RoBoard has the rich I/O interfaces to the servo, DC motors, sensors, gyroscope, accelerometers and other devices. Also, it has build-in the PWM 16 Ch, Hi-Speed serial, TTL serial, RS-485,USB V2.0 x 3, A/D convert, I^2C bus, 10/100M LAN and Mini PCI socket.

1.3 Specifications

	RB-100
CPU	DM&P Vortex86DX- 1000MHz
BIOS	AMI BIOS
Memory	256MB DDR2 onboard
ADCs	● Analog Devices AD-7918 10-bit
Hi-Speed UART	● FTDI FT2232HL Hi-Speed UART
I /O Interface	● Micro SD slot x1 ● USB port x 1 (USB 2.0 version)
Connectors	● 2.54 mm 3-pin box header for PWM x 16 ● 2.54 mm 10-pin box header for RS-232 x 1 ● 2.54 mm 10 pin box header for Hi-speed (COM 6) x 1 ● 2.0 mm 4 pin header for High speed (COM 5) x 1 ● 2.0 mm 4-pin header for RS-485 x 1 ● 2.0 mm 4-pin header for TTL serial x 2 ● 1.25mm 6-pin wafer for I2C x 1 ● 2.54 mm 16-pin header for A/D x 1 ● 2.54 mm 10-pin box header for USB x 1 ● 1.25 mm 4-pin wafer for LAN x 1 ● 1.25mm 6-pin wafer for JTAG x 1 ● 0.8mm 124-Pin Mini PCI Card connector ● 3.96 mm 2 pin for Power x 2
Resolution	PWM : 20ns Serial : 115200bps ~ 750Kbps (COM 1, 2, 3 & 4) High Speed Serial : Up to 12Mbps (COM 5 & COM 6) I^2C : 1Kbps ~ 3.3Mbps
Power Consumption	+5V @ 400mA
Power Input	DC-in 6V to 24V
Dimension	96mm X 56mm
Weight	40g

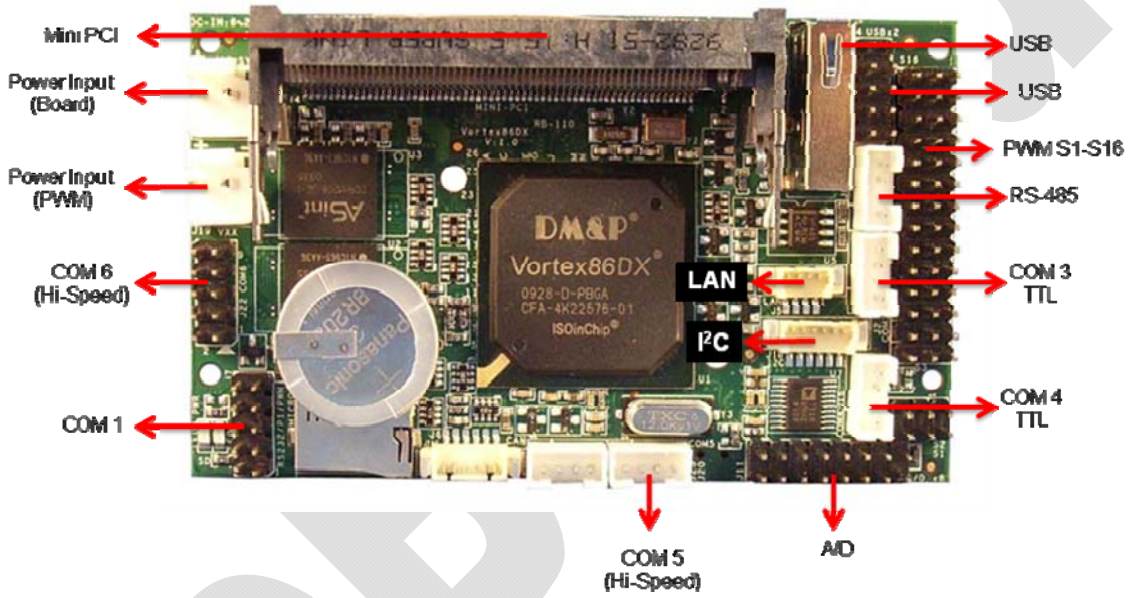
1.4 Board Dimension



Chapter 2

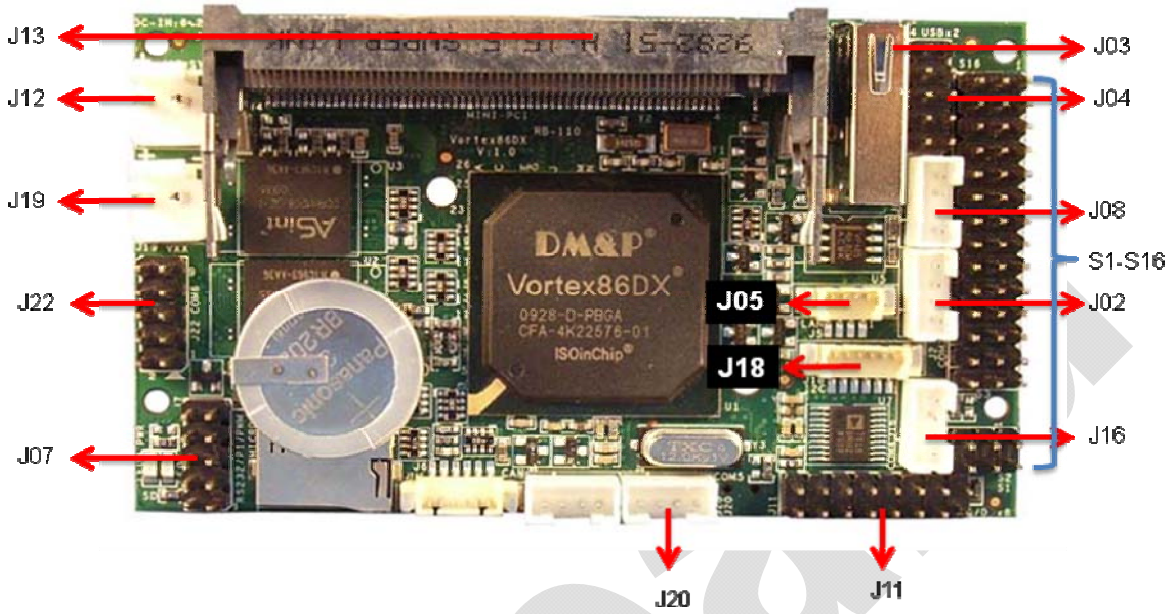
Installation

2.1 Board Outline

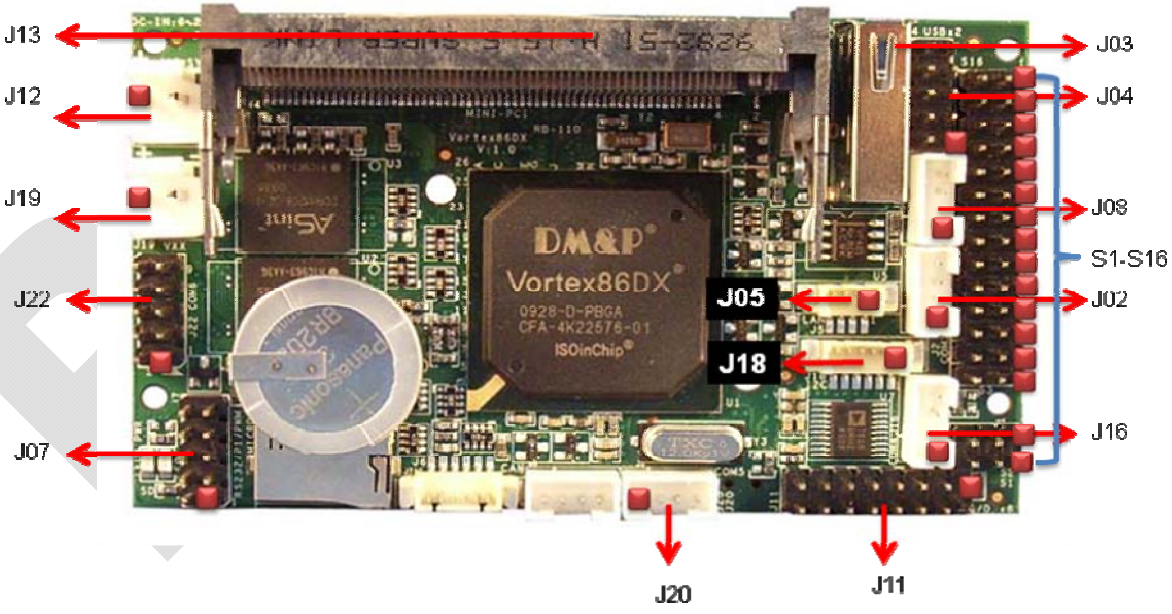


2.2 Connectors & Pin 1 Location

Connectors



Pin 1 Location



2.3 Connectors & Jumpers Summary

Summary Table

	Description	Type of Connections	Pin
J1	Micro-SD Slot	Micro-SD slot	13-pin
J2	COM 3 TTL	Box Header,2.0mm , 4x1	4-pin
J3	USB	USB 90 Deg	4-pin
J4	USB x 2	Pin Header, 2,54mm, 5x2	10-Pin
J5	LAN	Wafer, 1,25mm, 4x1	4-pin
J6	JTAG	Wafer, 2.54mm,6x1	6-pin
J7	COM1	Pin Header, 2.54mm,5x2	10-pin
J18	RS-485	Box Header,2.0mm , 4x1	4-pin
J11	A/D 8Ch	Box Header, 2.54mm, 8x2	16-pin
J12	Power Connector (Board)	Pin Header, 3.96mm	2-pin
J13	Mini PCI Socket	Mini PCI Type III	124-pin
J16	COM4 TTL	Box Header,2.0mm , 4x1	4-pin
J17	PWM initial pull up/down switch	DIP switch	
J8	I^2C	Wafer, 1,25mm, 6x1	6-pin
J19	Power Connector (PWM)	Pin Header, 3.96mm	2-pin
J20	COM 5 Hi-Speed (Port 1)	Box Header,2.0mm , 4x1	4-pin
J22	COM 6 Hi-Speed (Port 2)	Pin Header, 2.54mm,5x2	10-pin

2.4 Pin Assignments

PWM

Pin #	Signal Name	Pin #	Signal Name	Pin #	Signal Name
1	GND	2	Vxx	3	GPxx

J2: COM 3 Full Duplex TTL

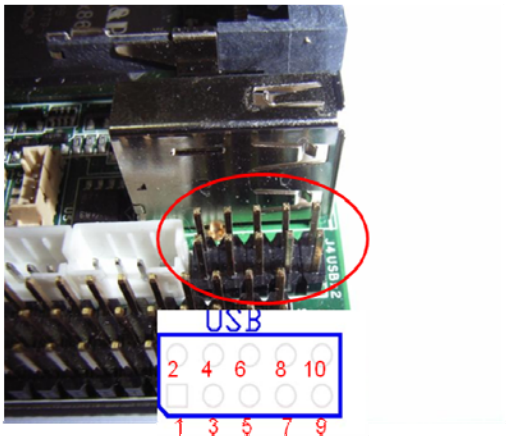
Pin #	Signal Name	Pin #	Signal Name
1	GND	2	Vxx
3	TXD3	4	RXD3

J3: USB -- 90 Deg

Pin #	Signal Name	Pin #	Signal Name
1	VCC	2	LUSBD2-
3	LUSBD2+	4	GND

J4: USB

Pin #	Signal Name	Pin #	Signal Name
1	VCC	2	VCC
3	LUSBD0-	4	LUSBD1-
5	LUSBD0+	6	LUSBD1+
7	GND	8	GND
9	GGND	10	GGND



J5: LAN

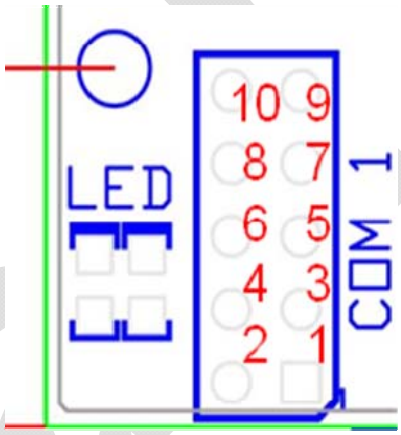
Pin #	Signal Name	Pin #	Signal Name
1	LAN-TX+	2	LAN-TX-
3	LAN-RX+	4	LAN-RX-

J6: JTAG

Pin #	Signal Name	Pin #	Signal Name
1	VCC	2	GND
3	TCK	4	TDO
5	TDI	6	TMS

J7: COM1 RS-232

Pin #	Signal Name	Pin #	Signal Name
1	DCD1	2	RXD1
3	TXD1	4	DTR1
5	GND	6	DSR1
7	RTS1	8	CTS1
9	RI1	10	NC

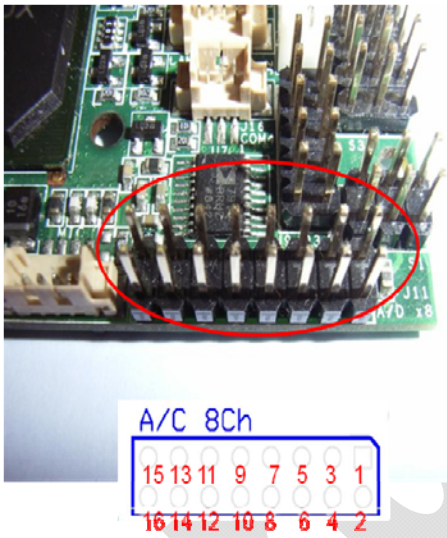


J8: COM2 RS-485

Pin #	Signal Name	Pin #	Signal Name
1	GND	2	Vxx
3	RS-485+	4	RS-485-

J11: A/D 8Ch

Pin #	Signal Name	Pin #	Signal Name
1	AD-VIN0	2	ADGND
3	AD-VIN1	4	ADGND
5	AD-VIN2	6	ADGND
7	AD-VIN3	8	ADGND
9	AD-VIN4	10	ADGND
11	AD-VIN5	12	ADGND
13	AD-VIN6	14	ADGND
15	AD-VIN7	16	ADGND



J12: Power Connector (Board)(DC 6V-24V)

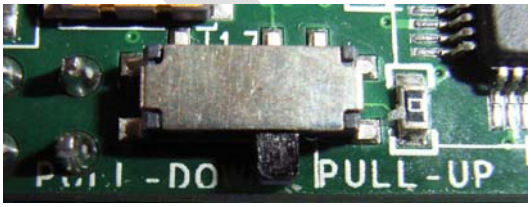
Pin #	Signal Name
1	Vxx
2	GND

J16: COM4 Full Duplex TTL

Pin #	Signal Name	Pin #	Signal Name
1	GND	2	Vxx
3	TXD4	4	RXD4

J17: PWM initial Pull up/down switch

Pin #	Signal Name	Pin #	Signal Name
1	PWM init Pull UP	2	PWM init Pull Down



J18: I²C

Pin #	Signal Name	Pin #	Signal Name
1	Vcc	2	GND
3	SCL	4	SDA
5	Reset	6	3.3V out

J19: Power Connector (PWM)(DC 6V-24V)

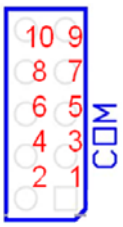
Pin #	Signal Name
1	Vxx
2	GND

J20: COM5 Hi-Speed serial (Port 1)

Pin #	Signal Name	Pin #	Signal Name
1	GND	2	Vxx
3	TXD5	4	RXD5

J22: COM6 Hi-Speed serial (Port 2)

Pin #	Signal Name	Pin #	Signal Name
1	DCD6	2	RXD6
3	TXD6	4	DTR6
5	GND	6	DSR6
7	RTS6	8	CTS6
9	RI6	10	TXDEN6



2.6 Watchdog Timer

There are two watchdog timers in Vortex86DX CPU. One is compatible with M6117D watchdog timer and the other is new. The M6117D compatible watchdog timer is called WDT0 and new one is called WDT1.

We also provide DOS, Linux and WinCE example for your reference. For more technical support, please visit: http://www.dmp.com.tw/tech or download the PDF file: http://www.dmp.com.tw/tech/vortex86dx/

Chapter 3

Driver Installation

VGA
The Vortex86DX processor also use external Display chip ““Volari™ Z9s” which is an ultra low powered graphics chipset with total power consumption at around 1-1.5 W. It is capable in providing VGA display output up to 1600x1200. With DVO interface, developers could easily connect flat Panel to support TFT and LVDS output.

LAN
The Vortex86DX processor also integrated 10/100Mbps Ethernet controller that supports both 10/100BASE-T and allows direct connection to your 10/100Mbps Ethernet based Local Area Network for full interaction with local servers, wide area networks such as the Internet.

AUDIO
CM119 is a highly integrated single chip USB audio controller specifically for VoIP (Voice over internet protocol) application. All essential analog modules are embedded in CM119, including dual DAC and earphone driver, ADC, microphone booster, PLL, regulator, and USB transceiver.

The RB-100 provides the VGA and LAN drivers for Windows XP, Windows CE 5.0 and Windows Embedded CE 6.0R2 and Windows Embedded Standard (XPe). Please get from official website: http://www.roboard.com

The RB-100 also supports most of the popular Linux distributions, for more detail information, please visit DMP official website:
http://www.dmp.com.tw/tech/vortex86dx/

A. Library, Sample and development code

The RB-100 provides the Library, sample and development code. Please download from official website: http://www.roboard.com

Warranty

This product is warranted to be in good working order for a period of one year from the date of purchase. Should this product fail to be in good working order at any time during this period, we will, at our option, replace or repair it at no additional charge except as set forth in the following terms. This warranty does not apply to products damaged by misuse, modifications, accident or disaster. Vendor assumes no liability for any damages, lost profits, lost savings or any other incidental or consequential damage resulting from the use, misuse of, originality to use this product. Vendor will not be liable for any claim made by any other related party. Return authorization must be obtained from the vendor before returned merchandise will be accepted. Authorization can be obtained by calling or faxing the vendor and requesting a Return Merchandise Authorization (RMA) number. Returned goods should always be accompanied by a clear problem description.