



Overview

The **Vortex86DX2** is a high performance and fully static 32-bit X86 processor with the compatibility of Windows based, Linux and most popular 32-bit RTOS. It also integrates 32KB write through 4-way L1 cache, 256KB write through/write back 4-way L2 cache, PCIE bus in at 2.5 GHz, DDR2, ROM controller, ISA, I2C, SPI, IPC (Internal Peripheral Controllers with DMA and interrupt timer/counter included), Fast Ethernet,

FIFO UART, USB2.0 Host and IDE/SATA controller within a single 720-pin BGA package to form a system-on-a-chip (**SoC**). It provides an ideal solution for the embedded system and communications products (such as thin client, NAT router, home gateway, access point and tablet PC) to bring about desired performance.

Features

- **X86 Processor Core**
 - 6-stage pipeline
- **Floating point unit support**
 - Extends CPU instruction set to include Trigonometric, Logarithmic and Exponential
 - Implements ANSI/IEEE standard 754-1985 for binary Floating-Point Architecture
- **Embedded I / D Separated L1 Cache**
 - 16K I-Cache, 16K D-Cache
- **Embedded L2 Cache**
 - 4-way 256KB L2 Cache
 - Write through or write back policy
- **DDRII Control Interface**
 - 32 bits data bus
 - DDRII clock support up to 400MHz
 - DDRII size support up to 2Gbytes
- **IDE Controller**
 - PATA 100 (Disk x 2) or SD Card x2
- **SATA Controller**
 - Supports 1 port serial ATA(1.5G)
- **ADC Interface x 8**
- **GPU Control Unit**
 - VGA controller
 - 2D Graphics engine support
 - UMA architecture
- **MAC Controller x 1**
- **PCIE Control Interface x 2**
 - Up to 2 sets PCIE device
 - 3.3V I/O
- **ISA Bus Interface**
 - AT clock programmable
 - 8/16 Bit ISA device with Zero-Wait-State
 - Generate refresh signals to ISA interface during DRAM refresh cycle
 - Support Max ISA Clock 33M
- **HDA Controller**
- **DMA Controller**
- **Interrupt Controller**
- **MTBF Counter**
- **Counter / Timers**
 - 2 sets of 8254 timer controller
 - Timer output is 5V tolerance I/O on 2nd Timer
- **Real Time Clock**
 - Less than 2uA (3.0V) power consumption in Internal RTC Mode while chip is power-off.
- **FIFO UART Port x 9 (9 sets COM Port)**
 - Compatible with 16C550 / 16C552
 - Default internal pull-up
 - Supports the programmable baud rate generator with the data rate from 50 to 6M bps
 - The character options are programmable for 1 start bits; 1, 1.5 or 2 stop bits; even, odd or no parity; 5~8 data bits
 - Support TXD_En Signal on COM1/2
 - Port 80h output data could be sent to COM1 by software programming
- **Parallel Port x 1**
 - Supports SPP/EPP/ECP mode
- **General Programmable I/O**
 - Supports 88 programmable I / O pins
 - Each GPIO pin can be individually configured to be an input/output pin
 - GPIO_P0~GPIO_P4 can be program by 8051A
 - GPIO_P0~GPIO_PA can be program by 8051B
 - GPIO_P0 and GPIO_P1 with interrupt support (input/output)
- **USB 2.0 Host Support**
 - Supports HS, FS and LS
 - 4 port
- **USB 1.1 Device Support**
 - 1 port
 - Supports FS with 3 programmable endpoint
- **PS / 2 Keyboard and Mouse Interface Support**
 - Compatible with 8042 controller
- **Speaker out**
- **Redundant System Support**
- **Embedded 2MB Flash**
 - For BIOS storage
- **I²C bus x 2**
 - Compliant w/t V2.1
 - Some master code (general call, START and CBUS) not support.



- **Motor Control Interface Support**
 - 3 groups of controller, 4 controllers per group
 - Each controller can configure to PWM/Servo/Sensor Interface mode
 - Controller interconnect to the other with routing network in the same group
 - 8051 Internal Motion Control Support
- **General Shift Interface Support**
 - 3 channel
- **JTAG Interface supported for S.W. debugging**
- **Input clock**
 - 14.318 MHz
 - 32.768 KHz
- **Full Duplex SPI bus x 2**
- **Output clock**
 - 24 MHz
 - 25 MHz
 - PCI clock
 - DDRII clock
- **Operating Voltage Range**
 - Core voltage: 1.0 V ± 5%
 - I / O voltage: 1.2V ± 5% , 1.8V ± 5% , 3.3 V ± 10 %
- **Operating temperature**
 - TBD
- **Package Type**
 - 31x31mm, 720 Ball BGA

System Block Diagram

