NetSilicon

NET+15

Embedded Ethernet/Internet-Ready Processor

Features

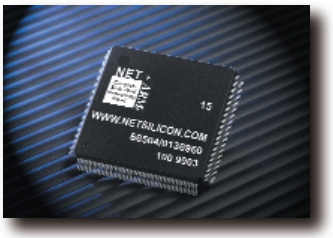
- 32-bit high performance ARM7TDMI RISC processor
- Integral 10/100BaseT Ethernet MAC
- Large 2KB Rx buffer for reliable network performance
- Patented 10-channel DMA controller
- Includes complete, production-ready NET+Works networking software and comprehensive development support
- Complete scalability throughout the product line with pin and software compatibility
- Run-time binary license for NetSilicon's NET+OS™ or Wind River's pSOS+™ RTOS included at no additional cost

Benefits

- Complete software and hardware for networking electronic devices
- Dramatic time to market reductions
- Reduce your product unit costs
- Save your engineering resources
  - No networking development
  - No long-term support needed
- Performance tuned
- Fully integrated solution
- Production ready now

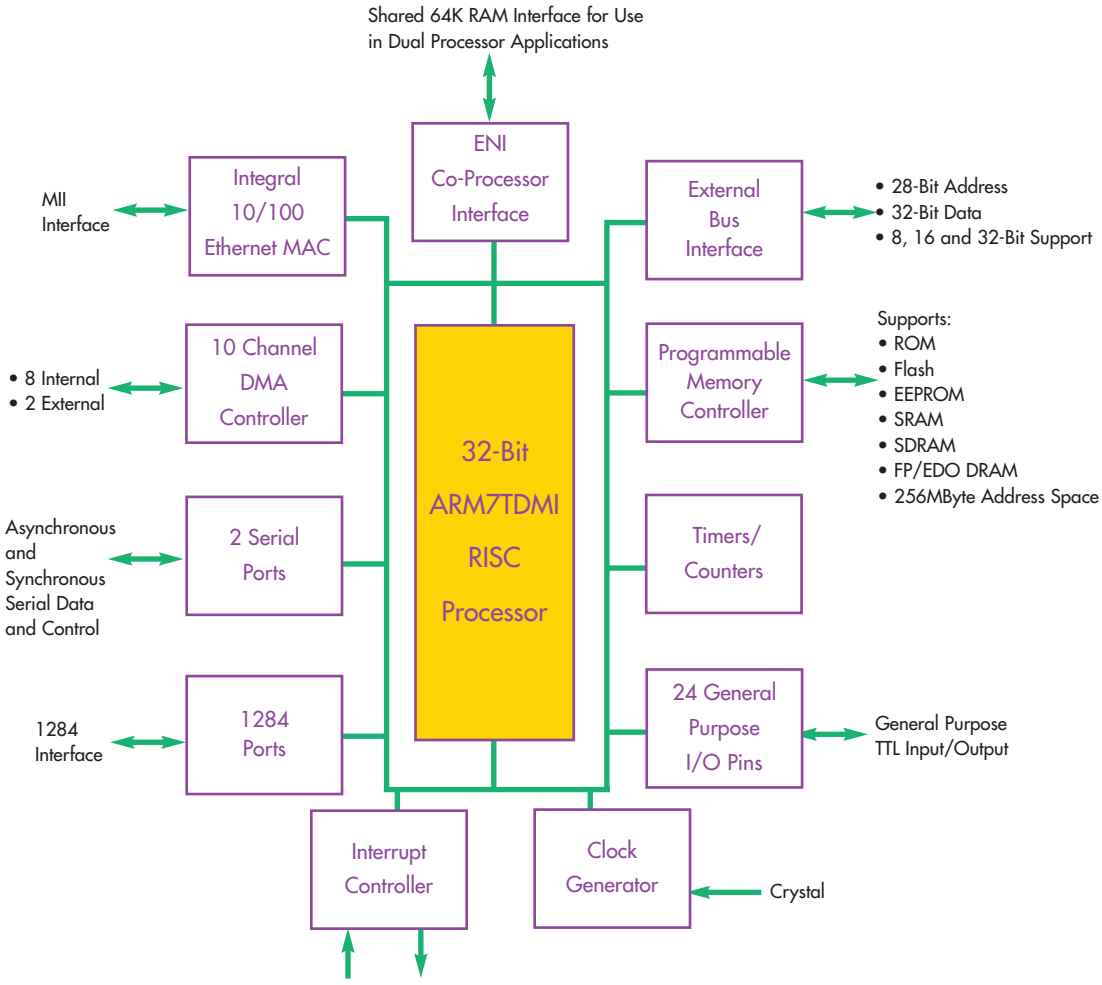
The NetSilicon NET+15™ is a high-performance, highly integrated 32-bit microprocessor designed for use in intelligent networked devices and Internet appliances. It includes an ARM7TDMI core, integral 10/100BaseT Ethernet MAC with an MII interface, patented 10-channel DMA controller and a sophisticated memory controller supporting all of the popular memory devices in use today.

The NET+15 is part of the award-winning NET+ARM™ family of networked microprocessors. This family provides scalability and pin-for-pin compatibility over



a broad performance range. NET+ARM microprocessors are the hardware core of the NET+Works™ platform of highly integrated and tested solutions for adding intelligence and connectivity to electronic devices.

NET+15 Processor Block Diagram



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Hardware Specifications

32-Bit ARM7TDMI RISC Processor

- Full 32-bit ARM mode
- 15 general-purpose 32-bit registers
- 32-bit program counter and status register
- 5 supervisor modes, 1 user mode

Integral 10/100 Ethernet MAC

- 10/100Mbit MII based PHY interface
- 10Mbit ENDEC interface
- Supports TP-PMD and fiber-PMD devices
- Full duplex
- Optional 4B/5B scrambling
- Full statistics gathering (SNMP and RMON)
- Station, broadcast, multicast address detection and filtering
- 128 byte transmit FIFO
- 2K byte receive FIFO
- Intelligent receive side buffer selection
- External CAM filtering

10-Channel DMA Controller

- 2 dedicated to Ethernet transmit/receive
- 4 dedicated to serial transmit/receive
- 2 dedicated to P1284 interface
- Flexible buffer management
- 2 channels configurable for external peripherals

Serial Ports

- 2 fully independent HDLC/UART/SPI serial ports
- 32 byte transmit/receive FIFOs
- Internal programmable bit-rate generators
- Bit rates from 75 – 230400: 16X mode
- Bit rates from 1200 – 4Mbps: 1X mode
- Odd, even, or no parity
- 5, 6, 7 or 8 bits
- 1 or 2 stop bits
- Both internal & external clock support
- Receive side character and buffer gap timers
- 4 receive side data match detectors

Bus Interface

- 5 independent programmable chip selects
- Supports 8-, 16-, 32-bit peripherals
- Supports external address decoding and cycle termination
- Supports dynamic bus sizing
- Supports ASYNC and SYNC peripheral timing
- All chip selects support SRAM, FP/EDO DRAM, SDRAM, Flash, EEPROM without external glue logic
- Internal DRAM address multiplexing
- Internal refresh controller (CAS before RAS)
- 256Mbyte addressing per chip select
- Burst-mode support
- 0-15 wait states per chip select
- Bootstrap support
- External bus master support
- Internal or external bus arbiters

P1284/ENI Interface

- 4 IEEE 1284 parallel ports
- 64K shared RAM ENI interface (8 or 16-bit)
- Full duplex FIFO mode interface (8 or 16-bit)
- 32 byte transmit/receive FIFOs

Timers

- Two independent 26-bit programmable timers
- Programmable watch-dog timer (interrupt or reset on expiration)
- Programmable bus timer

General Purpose I/O

- Up to 24 programmable I/O pins
- 4 pins with programmable interrupt

Clock Generator

- Simple external crystal
- On-board programmable phase lock loop
- Supports direct external clock input

Package

- 208-pin PQFP, 0.020 inch (0.5 mm) pitch
- 208-pin TQFP, 0.020 (0.5 mm) pitch, 0.063 inch max thickness

Other

- Operating voltage
  - 3.0 – 3.6V
- Industrial temperature range (-40ºC – 85ºC)

Development Support

NET+Works Development Systems

NET+ARM microprocessors are the hardware core of the NET+Works platform of highly integrated and tested solutions for adding intelligence and connectivity to electronic devices. NetSilicon offers a variety of options to support different application environments.

NET+OS Complete Development System

For deeply embedded applications requiring real-time performance and small code footprints. Includes:

- Thread-X RTOS
- Green Hills™ MULTI 2000 IDE
- NET+Works suite of drivers, protocols and services
  - NET+ARM Drivers (10/100 BaseT Ethernet MAC, Serial – UART, HDLC, DMA, Interrupt Controller, FLASH memory)
  - Networking Protocols (TCP/IP, UDP, PING, RARP, PPP, IGMP, Telnet)
  - Networking Services, with APIs (HTTP v1.1 Client and Server, POP3 and SMTP Email, FTP Client and Server, SNMP MIBII and proxy agent, BOOTP, DHCP & DNS)
- NET+ARM-based software development board
- NetSilicon-supplied utilities
  - Compile and load HTML into C and firmware
  - Network downloading of on-board FLASH memory
  - Automated build environment
  - NVRAM device manager
- Raven hardware debugger
- 1 year software maintenance and technical support
- Hardware design review
- Development System training at NetSilicon

NET+Works Standard Development System

Offers BSP-level support for Wind River's pSOS+™ and VxWorks® real-time RTOSs. The system includes:

- NET+Works networking software suite
- NET+ARM-based software development board
- 1 year software maintenance and technical support
- Hardware design review
- Development System training at NetSilicon

Third Party Tools

- Wind River's pRISM+™ graphical development environment for pSOS+
- Wind River's Tornado development environment for VxWorks
- JTAG port In Circuit Emulation (ICE)

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