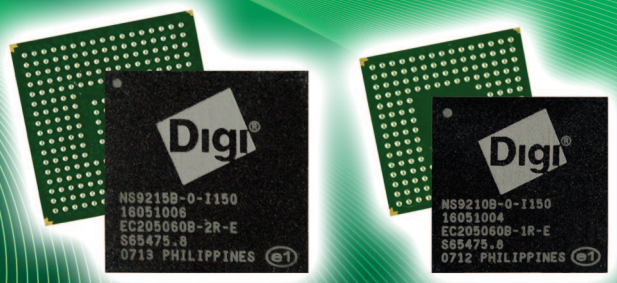
NS9210/NS9215

32-bit NET+ARM Processor Family

Cost-efficient, small footprint ARM926EJ-S processor with integrated encryption and unique interface flexibility.



Overview

The NS9210/NS9215 processor family offers a cost-efficient, small-footprint 32-bit ARM9 solution that combines high performance, integrated Ethernet networking, strong security, and unique interface flexibility. It is the ideal choice for a broad range of applications such as security/access control, medical, industrial/building automation, transportation and remote monitoring.

Two independent Flexible Interface Modules (FIMs) with 300 MHz DRPIC1655X processor cores provide a growing list of application-specific peripheral interface options. The NIST-compliant 256-bit hardware AES accelerator combines state-of-the-art data privacy services with superior performance, and Digi's patented dynamic power management addresses the needs of today's power budget-conscious designs.

The complete and easy-to-use development kits for NET+OS® are based on the field-proven ThreadX® Real-Time Operating System and deliver a true and IPv6-ready turnkey embedded development solution with the Eclipse-based Digi ESP™ IDE.

Platforms and Services


Design Services


Accessory Kits

Support

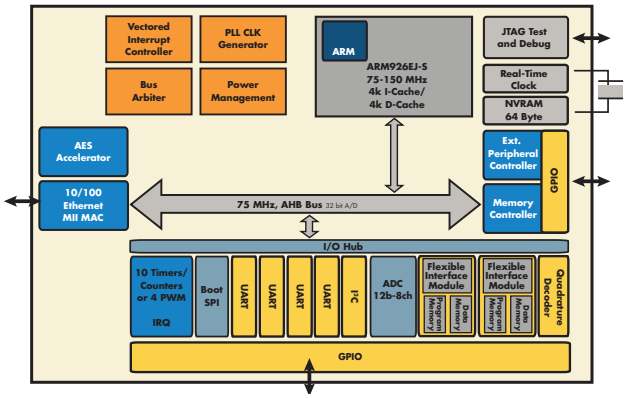
NET+OS

Supported Software Platforms

Block Diagram

NS9215

0.18μ CMOS, 265-pin BGA



Features/Benefits

- High-performance 150 MHz ARM926EJ-S core
- 10/100 Mbit Ethernet MAC integration
- On-chip hardware AES accelerator
- Software-configurable I/O flexibility through FIMs
- Power management modes with dynamic clock scaling
- Rich set of integrated peripheral interfaces
- Complete and royalty-free NET+OS development platform for network-enabled embedded devices
- Upgrade path to ARM9 core performance for existing NS7520 designs through pin-compatible NS9210

Development Kits

Development Kit Overview

Development Kit for NET+OS®

NET+OS is a royalty-free turnkey solution for embedded software development based on the ThreadX Real-Time Operating System (RTOS), which is one of the most reliable and field-proven RTOS solutions available. In addition to ThreadX, NET+OS provides a complete set of integrated building blocks needed to create product solutions with leading network security using Digi embedded microprocessors and modules.

For professional embedded software development, the Eclipse based Digi ESP™ Integrated Development Environment (IDE) for Microsoft Windows with graphical user interface and a high-speed USB 2.0 hardware debugger is provided out-of-the-box. A Green Hills MULTI IDE option is also available.

Digi professional design and support services are also part of the development kit. The included professional design review service improves time-to-market by minimizing the traditional design risk for prototyping and production units. In addition, one year of premium support service covers any software development related questions through the assistance of Digi's technical support experts.

- Royalty-free turn-key solution for embedded development
- Built on field-proven and compact ThreadX RTOS
- Fully integrated support for secure, IPv4/IPv6 networking applications
- Eclipse-based Digi ESP IDE for Windows software development
- Professional hardware design review included

Development Kit Contents

	NS9210	NS9215
Processor Module	NS9210 processor module with 150 MHz, 4 MB Flash, 8 MB SDRAM	NS9215 processor module with 150 MHz, 4 MB Flash, 8 MB SDRAM
Development Board	Ethernet connector, 4 serial ports (1 x RS-232/422/485, 1 x RS-232, 2 x TTL), User/Application connectors, I²C/SPI headers, ADC header, Screw terminal for access to 8 GPIO signals, 2 user push-buttons, 2 user LEDs, Wake-up button, Reset button, 802.3af PoE module connector, Prototyping area, Battery backup, 9-30VDC power supply, Power switch, Mounting holes	
CD/DVD	Digi NET+OS CD: NET+OS 7, Digi ESP IDE, BSP source code, Sample code, Green Hills MULTI support option, User documentation	
Documentation	Quick start guide, Digi ESP tutorial, NET+OS programmer's guide, NET+OS API documentation, Advanced Web Server, Hardware reference manual, Complete design schematics and bill of material	
Power Supplies and Accessories	External wall power supply (110/240VAC) with interchangeable outlet adapters (North America, EU, UK and Australia), Ethernet cable, Serial cable	
Other	Digi JTAG Link USB 2.0 hardware debugger, 802.3af PoE module, Professional Hardware Design Review, 1 year of Premium Support Service	
Kit Part Numbers	NS-9210-NET	NS-9215-NET

Please refer to the feature specs on our website for detailed information about the NET+OS software platform capabilities.

Platform	NS9210	NS9215
General		
Processor	ARM926EJ-S	
Speed Grades	75/150 MHz	
Cache	4 KB I-cache / 4 KB D-cache	
Process	0.18µ CMOS	
32-bit ARMv5TEJ Instruction Set	•	
16-bit Thumb Instruction Set	•	
MMU	•	
DSP Instruction Extensions	• (Improved divide, Single cycle multiply accumulate)	
ARM Jazelle® Java Accelerator	•	
Embedded ICE-RT Debug Unit	•	
JTAG Boundary Scan, BSDL	•	
Power Management Modes	•	
AES Accelerator		
Key Length	128-, 192-, 256-bit	
Cipher Modes	ECB, CBC, OFB, CTR, CCM	
Hardware Key Expander	•	
DMA-Enabled	•	
NIST-Compliant	•	
FIM (Flexible Interface Module)		
FIMs	1/2; Availability depending on application-specific use of external 16-/32-bit memory bus	2
Cores	8-bit DRPIC1655X	
Speed	Up to 300 MHz (4x bus speed)	
Data Memory (SRAM)	192 Bytes	
Program Memory (SRAM)	2 KB	
Interface Options	SD/SDIO, UART, 1-Wire, CAN, USB device (low-speed), Other; Please contact us for custom interface implementation options.	
Power Management		
Dynamic Clock Scaling (patent pending)	Full, /2, /4, /8, /16 speeds, with hardware clock scale control (wake-up events)	
Low-Power Sleep Modes	•	
Configurable Wake-Up Conditions	External IRQ, I²C, SPI, UART, Ethernet	External IRQ, I²C, SPI, UART, Ethernet, RTC
Disabling of Unused System Modules	•	
Memory Controller		
Glue-less Interface	• (SDRAM, SRAM, Buffered DIMM, EEPROM, Flash)	
Self-Refresh (Sleep Mode)	•	
Dynamic/Static Memory Chip Selects	Selection of 5	4/4
Wait States Per Memory Chip Select	0-32	
Static Memory Controller Extended Waits (EW)	Up to 16,368	
Automatic Dynamic Bus Sizing	•	
Burst Support	8-transfer, with automatic data width adjustment	
External DMA Channels	2	

••Chip Feature

Platform	NS9210	NS9215
System Bus DMA		
High-Speed Rotating AHB arbiter	16 channels	
Deterministic Bus Bandwidth Allocation	•	
Multiple Bus Masters	Ethernet Tx/Rx, I/O Hub, Ext DMA, ARM core	
External DMA		
Independent DMA Channels	2	
Transfer Modes	External peripherals, External memory, AHB peripherals	
AES DMA Support	•	
AHB Master	•	
I/O Hub		
Low Latency	•	
DMA	8 channels	
DMA or Direct Access Mode	UART, SPI, FIM	UART, SPI, ADC, FIM
Direct Access Mode Only	I^2C	I^2C, RTC
AHB Master	•	
External Interrupts		
External Programmable Interrupts	4	
Advanced Vectored Interrupt Controller		
Two-Tier Priority	• (FIRQ/IRQ)	
Low-Latency FIRQ	•	
Interrupt Sources	32	
Ethernet MAC		
Data Rates	10 / 100 Mbit/s	
Duplex	Full and Half	
PHY Interface	MII	
Address Filtering	Station, Broadcast, Multicast	
FIFO	2 KB Rx / 256 Byes Tx	
Separate Tx and Rx DMA Channels	•	
Programmable 8-Entry Restrictive Multicast Filtering	•	
Access Modes	Interrupt and DMA	
AHB Master	•	
UART		
Ports	2 / 4; Availability depending on application-specific use of external 16-/32-bit memory bus	4
Bit Rates	Up to 1.8432 Mbps	
Data Format	5 to 8 data bits; Odd, Even, or No parity; 1 or 2 stop bits; MSB or LSB first	
Channel Modes	Normal, Local loopback, Remote loopback	
Modem Control Signals	RTS, CTS, DTR, DSR, DCD, RI	
Maskable Interrupt Conditions	Receiver idle; Transmitter idle; Receive error conditions; Character gap timeout; Character match events; State change detection: CTS, DSR, DCD, RI	
FIFO	2 KB Rx / 256 Byes Tx	
Transmit FIFO Bypass	•	

••Chip Feature

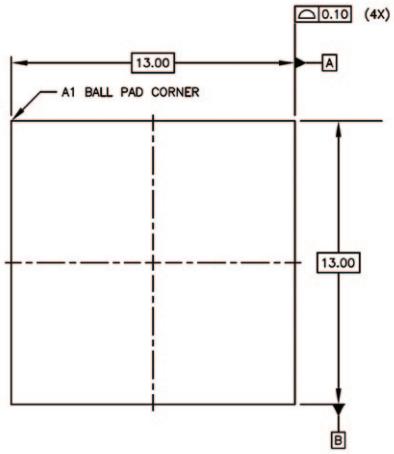
Platform	NS9210	NS9215
I²C v1.0		
Master/Slave	•	
Bit Rates	100 kbit/s and 400 kbit/s modes	
Address Modes	7-bit, 10-bit	
Bus Arbitration	•	
SPI (with Boot)		
Master/Slave	•	
Bit Rates	33 Mps (Master) / 7.5 Mpbs (Slave) max	
SPI Modes	0, 1, 2, 3	
Maskable Interrupt Conditions	•	
Boot Support	Serial EEPROM, High-speed ROM/flash	
Patent Pending Serial Boot Circuit	Automatic configuration, Internal register setup, Boot code transfer to external memory	
POR		
3.3V Voltage Monitoring	–	•
Early Power-Loss Comparator with Alert for Main Power Shutdown	–	•
Auxiliary Analog Comparator	–	2.4V trip point
ADC		
Resolution/Conversion	–	12 bit/1 MHz
Multiplexed Inputs	–	Single-ended 8:1
Rail-to-Rail Input Range	–	•
12-Bit Output	–	DMA/Direct
External Reference	–	•
Timers/Counters/PWM		
General Purpose Timers/Counters	10 (32-bit)	
PWM	Up to 4 with basic or enhanced functionality	
Quadrature Decoder	•	
Software Watchdog Timer	IRQ, FIQ, RESET	
GPIO		
Multiplexed GPIOs	Up to 54	Up to 108
Real-Time Clock		
Alarm Masks and Event Detection	–	•
Calendar	–	1900-2999
Resolution	–	10 ms
Integrated NVRAM	–	64 Bytes
External Battery Backup	–	•
External Clock Source	–	•
Operating Voltage		
Core	1.8V	
I/O Ring	3.3V	
5V-Tolerant GPIO and Memory Inputs	•	

••Chip Feature

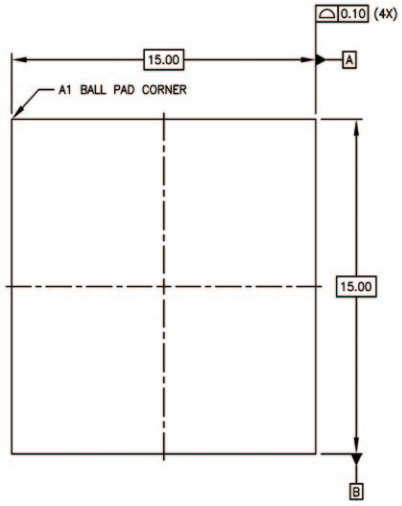
Platform	NS9210	NS9215
Operating Temperature		
75/150 MHz	-40° C to +85° C	
Power Dissipation		
150 MHz Core/75 MHz Bus	1.019 W	
75 MHz Core/75 MHz Bus	0.828 W	
112 MHz Core/56 MHz Bus	0.638 W	
56 MHz Core/56 MHz Bus	0.499 W	
Sleep Mode, Wake on Ethernet	0.073 W	
Sleep Mode, Wake on Ext IRQ	0.055 W	
Main Power Down, Battery Draw	–	3.0V – 32 µA; 1.8V – 6 µA
Package		
Type	177-pin BGA (Pin-compatible with NS7520)	265-pin BGA
Ball Pitch	0.8 mm	
Size	13 x 13 mm	15 x 15 mm
Lead-Free, RoHS Compliant	•	

••Chip Feature

NS9210



NS9215



Visit www.digiembedded.com for part numbers.

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