

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 DRP1655X 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

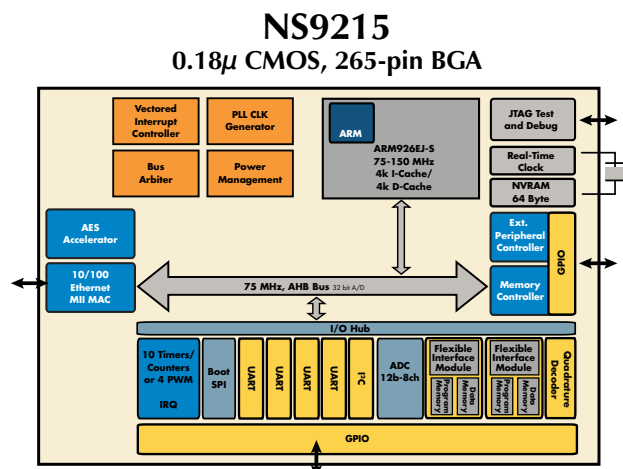


Support

NET + OS

Supported Software Platforms

Block Diagram



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, I ² C/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 DRP1C1655X			
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			

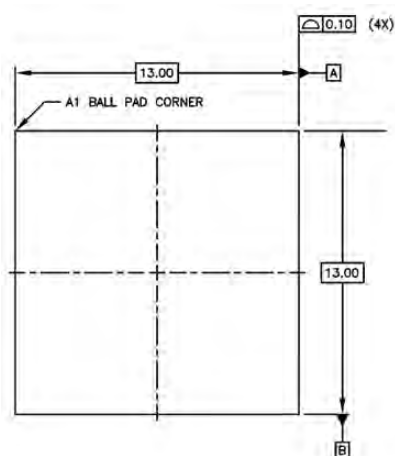
Platform		NS9210	NS9215
System Bus DMA			
High-Speed Rotating AHB arbiter	16 channels		
Deterministic Bus Bandwidth Allocation	•		
Multiple Bus Masters	Ethernet Tx/Rx, I/O Hub, Ext DMA, ARM core		
External DMA			
Independent DMA Channels	2		
Transfer Modes	External peripherals, External memory, AHB peripherals		
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 ² C	I ² C, 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 Bytes 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 Bytes Tx		
Transmit FIFO Bypass	•		

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 Mbps (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	•		

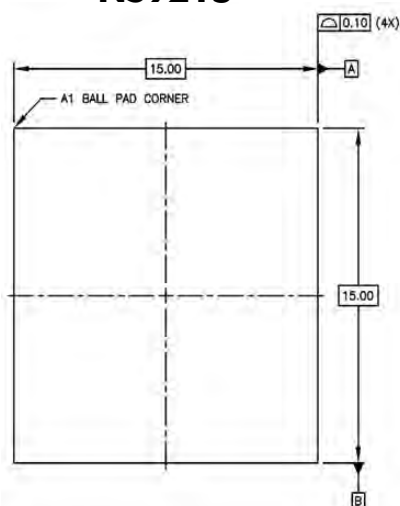
Platform		NS9210	NS9215
Operating Temperature			
75/150 MHz	-40° C to +85° C		
Power Dissipation			
150 MHz Core/75 MHz Bus	1.019 W		
75 MHz Core/75 MHz Bus	0.828 W		
112 MHz Core/56 MHz Bus	0.638 W		
56 MHz Core/56 MHz Bus	0.499 W		
Sleep Mode, Wake on Ethernet	0.073 W		
Sleep Mode, Wake on Ext IRQ	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



You can purchase with confidence knowing that Digi is always available to serve you with expert technical support and our industry leading warranty. For detailed information visit www.digi.com/support

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