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Embedded - Microcontrollers - Application Specific: Tailored Solutions for Precision and Performance

Embedded - Microcontrollers - Application Specific represents a category of microcontrollers designed with unique features and capabilities tailored to specific application needs. Unlike general-purpose microcontrollers, application-specific microcontrollers are optimized for particular tasks, offering enhanced performance, efficiency, and functionality to meet the demands of specialized applications.

What Are Embedded - Microcontrollers - Application Specific?

Application-specific microcontrollers are engineered to

Details	
Product Status	Active
Applications	Network Processor
Core Processor	MIPS32® 34Kc™
Program Memory Type	SRAM
Controller Series	-
RAM Size	-
Interface	I²C, RMII, UART
Number of I/O	-
Voltage - Supply	-
Operating Temperature	-
Mounting Type	Surface Mount
Package / Case	896-BGA, FCBGA
Supplier Device Package	896-FCBGA (31x31)
Purchase URL	https://www.e-xfl.com/product-detail/microchip-technology/wp3161w6nhei-400b1

WP3SL WinPath3 SuperLite

Next Generation Access Systems Packet Processor

Released Product Brief

Product Overview

The WinPath3 SuperLite provides a powerful, lower-cost WinPath3 solution for access processing in the wireline and wireless access infrastructure equipment market. This device family leverages PMC's broad portfolio of hardened market-ready protocols and industry preferred I/O interfaces and provides this solution at a lower price.

The WinPath3 SuperLite has six WinGine processing elements at up to 400 MHz and supports the latest packet-based protocols: Ethernet, PWE3 (Ethernet TDM, HDLC, ATM), and Packet Network Synchronization (IEEE 1588v2, Synchronous Ethernet, adaptive and differential clock recovery). It also supports ML-PPP, IMA, CES, OAM (Ethernet and ATM), QoS (policing, shaping, per-flow queuing, WRED), and many other protocols. The WP3SL incorporates new WP3 hardware accelerators such as a flexible high performance classifier, a hierarchical shaper, an integrated security engine and more.

The WinPath3 SuperLite integrates control plane and enhanced data plane processing components. Control plane processing is based on two high-performance MIPS 34K multi-threaded processors. Data plane processing uses new hardware accelerators for packet classification, hierarchical shaping, additional security standards and more to offload common processing tasks. The accelerators are flexibly combined with a field-proven, fully-programmable, high-performance multi-threaded multi-core data path processor subsystem.

Benefits

- High performance of WinPath3 device family at a lower cost
- Innovative thread processing architecture provides higher overall system bandwidth with lower system cost and design complexity.
- Straightforward upgrade of WinPath2 applications for improved performance and capability of next-generation access systems
- Minimum design risk, short time-to-market, and lowered costs for new or migrated systems

Product Highlights

- 2x performance, higher integration than 2nd-generation WinPath2
- Numerous WAN and LAN interfaces supported, including 6Gb Ethernet, 24 Fast Ethernet, 16 TDM and dual SPI-3/POS L2/Utopia L2
- Wide range of bus interfaces available including PCIe plus integrated memory controllers supporting DDR2/DDR3 SDRAM with ECC
- Royalty free "production hardened" data path software supporting over 60 protocols, plus C language API for rapid system integration
- RAM-based Data Path code store to facilitate evolving wireline and wireless standards
- Available data path software supports interworking, QoS, and Layer 2 protocols (MPLS, EFM G.Bond, PWE3-SATOP, Link Aggregation, GRE, WRED, WFQ, VLAN-aware bridging and more)
- 100% software compatible with WinPath3; application software can be easily ported between WinPath3 and WinPath3 SuperLite
- Custom programming available via rich suite of development tools plus extensive library of source code and example programs

RISC Control Processor (Optionally Disabled)

- Integrated multi-threaded MIPS 34Kc at 650MHz, 64K/32K I/D caches

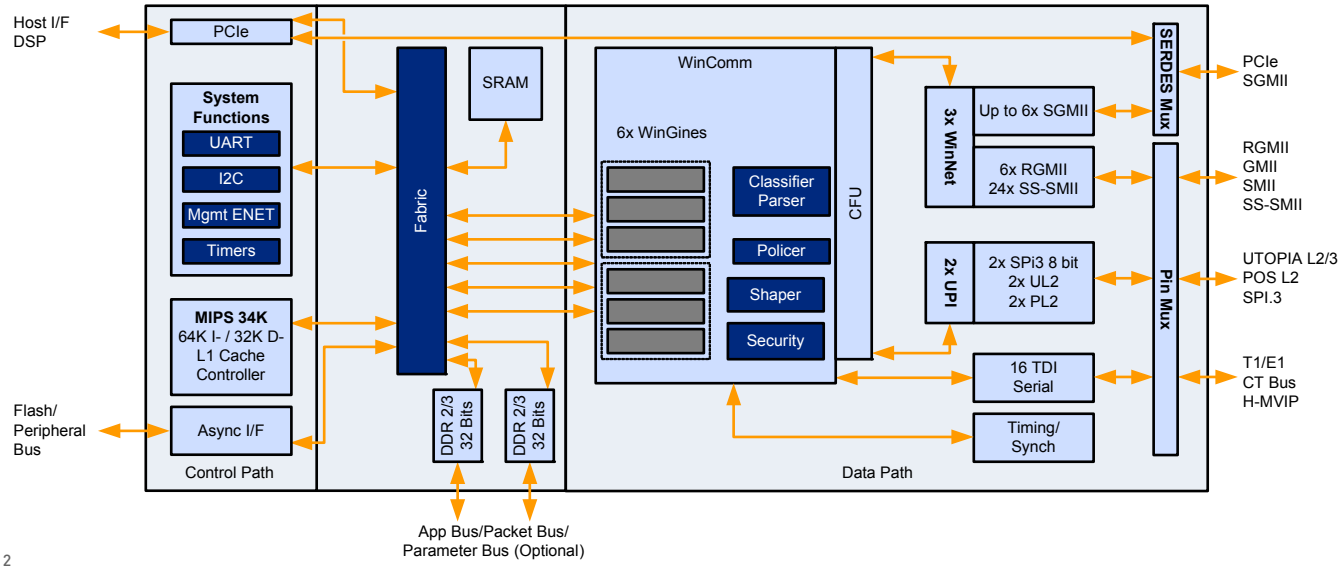
Data Path (WinComm3)

- 6 WinGines running at 320 MHz
- 2 Gbit/s @ 64 bytes packets, full duplex Ethernet-based routing/bridging application; 7.5 MPPS incl. classification, policing &shaping

New Hardware Accelerators

- Classifier (wire speed classification on all interfaces) with 8K rules including bridging support, up to 400M classification searches/s
- Policer accelerator supports dual leaky bucket for up to 64K policers
- Shaper with 4K flows with WRED accelerators
- eWSE (Snow-3G, PKE; performance comparable to WinPath2)
- Synchronization over packet networks (clock recovery): adaptive, differential, IEEE 1588v2, Synchronous Ethernet

Block Diagram



PMC-2113379, Issue 2

WP3SL WinPath3 SuperLite Next Generation Access Systems Packet Processor

Bus and Memory Interfaces

- 2 x 32bit DDR2/3 @1200 Mbit/s per pin.
- 0.75 Mbytes internal memory (Parameter Memory); NOR and NAND Flash memory support
- Asynchronous peripheral bus
- 1x PCI Express interface v1.1

Serial Interfaces

- 3 WinNet, supporting 6x GigE (SGMII or RGMII or RTBI) or 4 GMII, 3x GigE2.5 (Over-clocked SGMII @ 3.125 Gbit/s), 24 x Enet 10/100 (SMII/SS-SMII)
- 2 UPI supporting 2xUL2/PL2 16 bit or 2x SPI.3 8 bit
- 16 TDI supporting T1/E1/T3/E3 or CTCT/MVIP bus
- Peripheral Ports (Fast Ethernet, UART, I2C, etc)
- 6 multi-standard SERDES lanes shared by SGMII, over-clocked SGMII and PCIe interfaces can directly drive backplanes; integrated CDR

Physical and Electrical

- 65 nm technology; 27mm x 27mm 672 FCBGA with 1mm ball pitch
- Low power: 3 – 6 W at nominal clock rate, depending on configuration

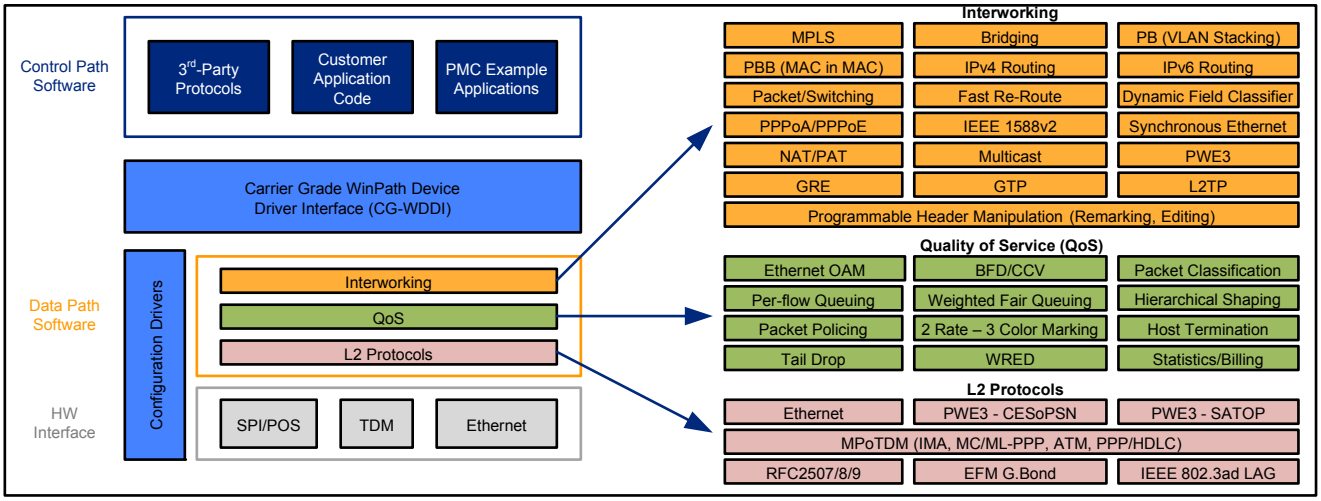
Reference Boards

WinPath3 SuperLite reference boards are available for early software development while a customer's own board is being developed. The boards are offered standalone or in standard AMC form factors for use with any AMC chassis, and with various I/O options and adapter cards to provide equivalent configurations for a range of applications.

WP3 and WP3SL Comparison

Feature	WinPath3	WinPath3 SuperLite
Packet Engine	Up to 12	Up to 6
Performance	Up to 15 MPPS	Up to 6MPPS
Security Engine	2x WSE	1x WSE
Traffic Manager	16K flows, 3-level H-QoS	4K flows, 3-level H-QoS
Class. Engine	32K rules	8K rules
Policer Accelerator	64K profiles (16K internal)	64K profiles (16K internal)
Internal Memory	2.5 MB	0.75 MB
Memory Interfaces	3xDDR2/3 16/32 bit 600MHz	2xDDR2/3 16/32 bit 600MHz
UPI/POS Interfaces	2x SPI3 32 bit 3x PL2 16 bit 3x PL3 8 bit	2x PL2 16 bit 2x PL3 8 bit
EMPHY	Yes	No
TDM Interfaces	Up to 16	Up to 16
Clock Recovery	Adaptive, differential, 1588v2	Adaptive, differential, 1588v2
Synch. Ethernet	Yes	Yes
WinNets	8	3
XAUI	2	-
Gb Ethernet	12	6
Fast Ethernet (SS)-SMII	72	24
SERDES	14	6
MIPS Cores	2x MIPS 34k 650MHz	1x MIPS 34k 650MHz
PCI Express	Yes	Yes
SRIO	Yes	No
Package	31x31 mm	27x27 mm

WinPath3 SuperLite Software



Further Resources

Technology Webpage

www.pmcs.com/products/mobile_network/

Technical Documentation

www.pmcs.com/resources/downloads_support.html

About PMC

PMC (Nasdaq:PMCS) is the semiconductor innovator transforming networks that connect, move and store digital content. Building on a track record of technology leadership, we are driving innovation across storage, optical and mobile networks. Our highly integrated solutions increase performance and enable next generation services to accelerate the network transformation. For more information visit www.pmcs.com.

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