PRODUCT BRIEF
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WinArrow1
IP DSLAM market-specific silicon & software

WINPATH™ ACCESS PACKET PROCESSORS

Product Highlights

The WinArrow1 is a streamlined part targeted specifically at high throughput IP DSLAMs. It is designed specifically for Access, so provides the high-performance and low power consumption this market requires. It delivers performance from 700-1000 Kpps, depending on device frequency for bridging interworking, a single filter, and minimal statistics.

- Supports asymmetric rates (E.g. 600Kpps downstream and 100Kpps upstream).
- Feature enhancements via software upgrades
- WinArrow1 Interconnect:
  5Kc On-Chip MIPS Core
  Two Gigabit Ethernet ports (both GMII and TBI)
  Two UTOPIA/POS Level 2 Ports
  RS232 & I2C ports
  Two TDM style interfaces
- Memory Configurations:
  Up to 64-bit Packet Bus, SDRAM
  Up to 64-bit Parameter Bus, SDRAM or ZBT
  Up to 64-bit Host Bus, Flash and SDRAM
- 2.5-4.7W. 0.18 Micron Technology, 3.3V I/O, 1.8V internal
- 913 Lead HSBGA. 1 mm ball pitch 40mm x 40mm
- Package Offered in 233, 200, 166 MHz Versions
- Industrial Temperature support (-40 to +85)
- Full control plane solution available

WinArrow blends the advantages of the alternative approaches:

Both Control and Data Path functionality are integrated in a single device, with separate dedicated processing elements for data and control.

WinArrow1 is designed for Access (unlike NPs), so provides the required performance for IP Line Cards, yet boasts frugal power consumption.

To accelerate development, all Data Path Features are ready to use –learning the architecture or modifying code is not required.

This device is RAM-based, allowing for easy feature enhancements via software upgrades without repartitioning code.

Data Path Hardware

- WinComm:
  -Multi Engine Data Path Processing Unit

- Bus Interfaces:
  -2 X SRAM or SDRAM 32/64 bit for Packet storage, tables and variables

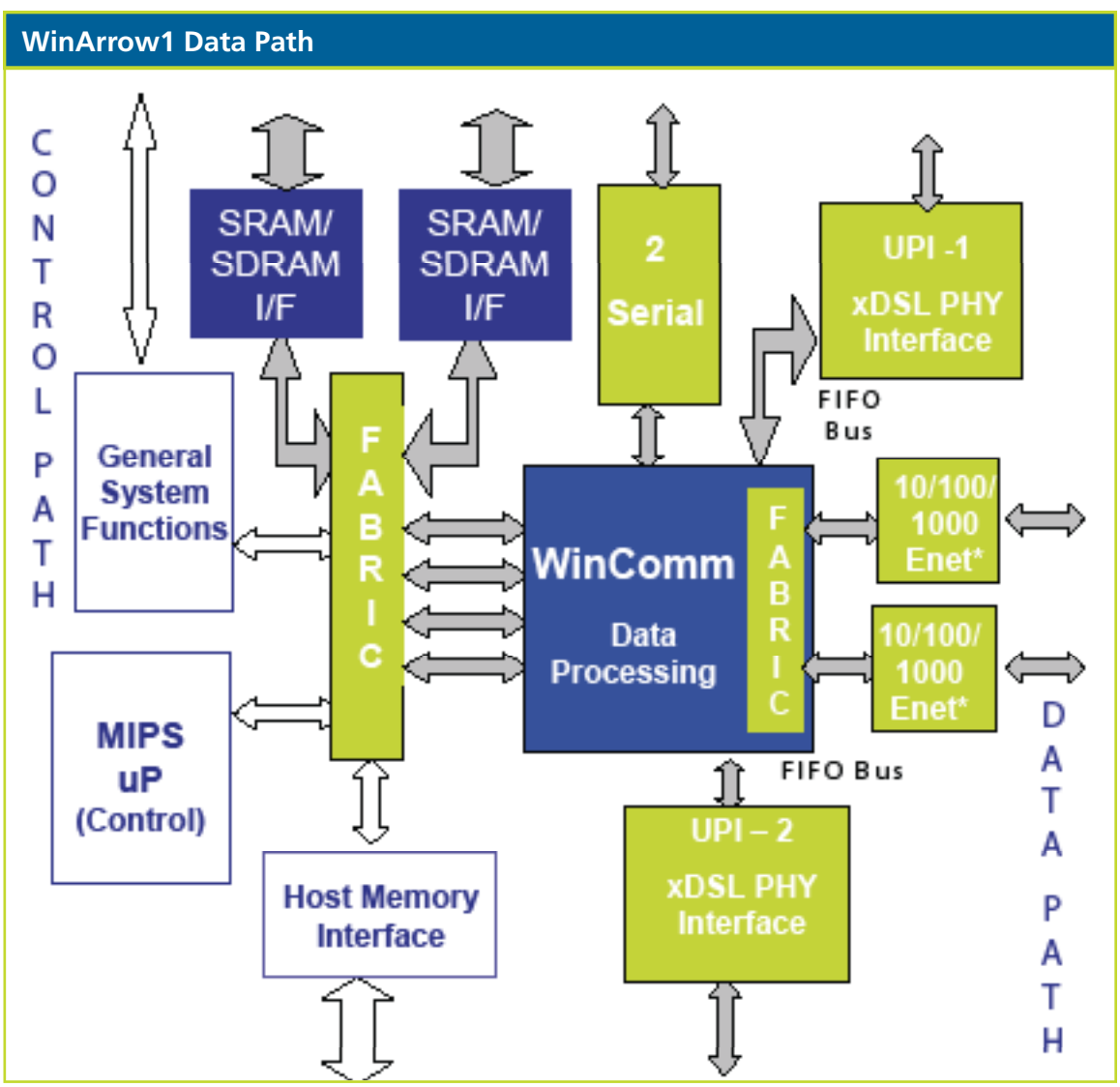
- Serial Interfaces:
  -Dual UTOPIA/POS-2 master/slave for DSL PHY interconnect
  -Supports 248 individual PHYs
  -UTOPIA/POS multi-PHY ports supports up to 100 Mbps (VDSL rates)
  -Mixed mode (ADSL/VDSL) support
  -Dual Ethernet 10/100/1000 for Back plane interface redundancy & subtending support
  -TDI clear channel port supporting host-terminated operation for code downloads and management

Data Path Software

Customers can take advantage of Wintegra's field-proven Data Path Software suite for DSL applications. All features may be used without modification, resulting in faster time to market. Features include: encapsulation & bridging, filtering, traffic shaping and management, and multicast.

This device meets all the requirements of WT-101. Ask Wintegra for compliance statement.

WinArrow1 Data Path



Control Hardware

- Standard RISC processor:
  -Handles Data Path configuration & full control plane functionality
  -166-233 MHz MIPS 5KC 64-bit Core
  -16K I-cache and 16K D-cache
  -32-bit Address /64-bit Data Bus

- General System Functions:
  -Eliminates the need for any glue logic
  -Timers, UART, I2C, EJTAG
  -Interrupt controller

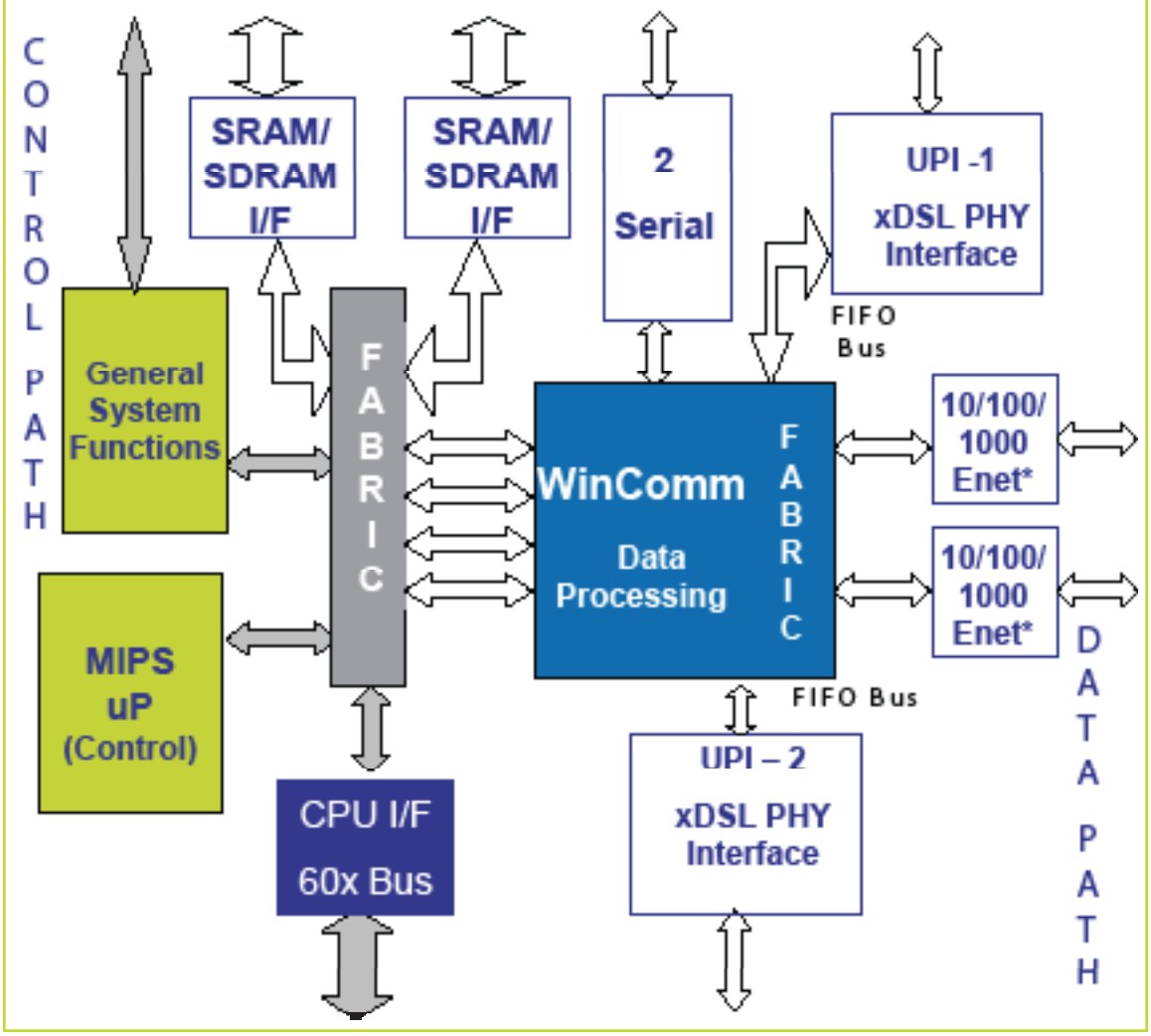
- Bus Interfaces:
  -Provides interface for Host Processor Memory and Peripherals (DSL PHYs)
  -64-bit Flash, SDRAM & Peripheral

Control Software

- Support for standard OS
- BSP and Data Path Veneer available for VxWorks 5.5 and Linux

Wintegra's optional WinPath Linux Services (WLS) turn-key control path solution is also provided. This option requires an additional support fee.

WinArrow1 Control Path



Bulit-in Interworking features

WinArrow interworking features (listed below) are built into the data path software and WDDI. They are a part of the chip, and require no additional charges, such as licensing fees or royalties.

ATM to IP Interworking
Transparent or VLAN Aware Bridging between GbE, GbE and UTOPIA
Filtering – Unlimited set of DFC Filtering options based on various port, session and L2, L3 and L4 header fields
4K Flows
4K VLANs (including optional VLAN Stacking)
1024 VCs (including per VC queuing or up to 8 priority queues per VC)
Multicast and IGMP Snooping with 1024 Multicast Groups
TM 4.1 Compliant UBR, VBR, GFR, CBR
ATM OAM
PPPoE
PPPoA
ATM Cell transport in Ethernet Frames
Mixed mode (ADSL/VDSL) selectable per PHY
ATM G.Bond
Ethernet G.Bond (under development)

WinArrow uses a market-specific DPS and WDDI software revision that is a derivative of the 2.3 DSLAM software revision from the WinPath family.

Since WinPath DPS software for the DSLAM market is already very mature and stable, it will require less support effort and allow faster time to market for the customer.

The post-release technical support for WinArrow customers is provided to the same high standard as with other Wintegra products.

As the WinArrow family evolves, it is expected that customers will migrate to new software releases on the new silicon.

Customer "special needs" may be contracted through Wintegra's engineering services team as a separate transaction.

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