Helium™ 200 Communications Processor

GlobespanVirata

Product Profile

February 2002

KEY FEATURES

- **ATM Switching and layer 2/3 processing device**
- **USB for external modem applications**
- **Ethernet 10/100 MAC with MII interface**
- **Utopia 1/2 for interface to external PHYs**
- **Dual ARM RISC processor architecture**

Product Applications

- DSL Modem
- DSL Gateway/Router
- DSL/ATM Line Cards
- ATM Access
- ATM CSU/DSU
- Bridging/Routing

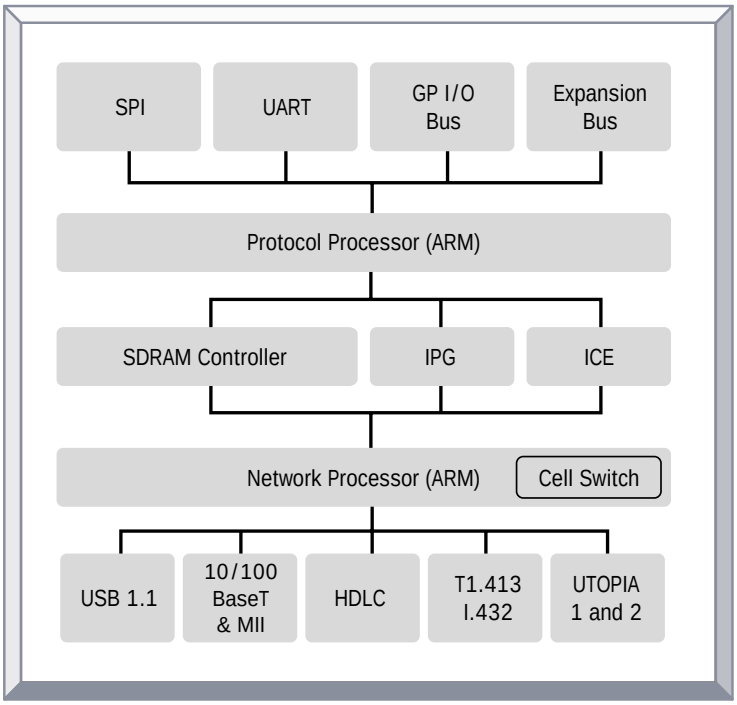
Application

The Helium™ 200 is a single-chip communications processor, performing ATM switching and layer 2/3 processing. A general purpose RISC Protocol Processor runs higher layer protocols while a high-performance microcoded RISC Network Processor is used for cell and frame handling, switching traffic at up to 75Mbps.

Integrating many common interface functions, the Helium 200 communications processor is designed for flexible, low-cost, high- functionality, high-performance products. It may be used in DSL router/gateway, ATM access device, or USB modem customer premises equipment (CPE) or central office (CO) equipment.

The Helium 200 communications processor contains a Network Processor that controls the direct connections to the Ethernet MAC and USB, physical interfaces for Utopia 1 and 2, HDLC and I.432 Framer.

The Network Processor has 16K of microcode RAM and a high-speed interface to external SDRAM. This supports both ATM cells and packets, OAM cell handling, policing, shaping and accounting. The two processors communicate via the inter-processor gateway IPG.



Helium 200 System Interfaces

The Helium 200 communications processor extends GlobespanVirata's ATOM architecture and runs the complete suite of GlobespanVirata networking software including support for routing, bridging, signaling, and SNMP Management.

Software flexibility, high-integration and built-in hardware debugging (ICE) support allow rapid product development.

This combination of hardware and software, Integrated Software on Silicon™ (ISOS™) provides a unique time to market advantage.

Reference Platform

The BD6200 is the development platform for GlobespanVirata's Helium 200 ASSP, providing a wealth of hardware and software debug tools to assist partners in rapid development and deployment of their products. Training, documentation and support are also available.

Specifications

Processors

- Protocol Processor (PP) is an ARM7TDMI RISC core that includes a 4K cache providing:
  - Modem PHY Management (depending on application)
  - Initialization code
  - Soft real-time tasks
- Network Processor (NP) is an ARM7TDMI RISC core with 16K of SRAM performing:
  - Data Transfer
    Framing
    Interleaving
    CRC Generation
    Switching
  - Hard real-time tasks

USB

USB 1.1 slave interface – up to 12Mbps using Control, Interrupt, Bulk and Isochronous endpoints and transfers.

10/100 Ethernet MAC with MII Interface

The 10/100 Ethernet MAC can interface to external PHYs using the MII interface on Helium 200.

Helium 200

Interfaces

- USB 1.1
- 10/100 Ethernet MAC
- Utopia 1/2
- HDLC/I.432
- GPIO
- Expansion Bus
- UART
- SDRAM
- Flash PROM
- EEPROM
- PCMCIA (Master)

Utopia

Utopia 1 and 2 (master/slave) interfaces with 31 ports, configuration:

- 8 ports dual-latency, or
- 2 ports dual-latency and 29 ports single latency

I.432 Framer

The Helium 200 communications processor implements all the framing requirements I.432 of T1.413, allowing full duplex data interface to external ADSL PHY.

HDLC

The HDLC interface uses the same pins as the I.432 framer. The HDLC interface conforms to Q.921 at a frame rate of 20Mhz with 16-bit CRC generation.

SDRAM

SDRAM interface conforms to JEDEC requirements, supporting 2 to 32 Mbytes of address space with a selectable 16 or 32 bit data bus.

GPIO

The General Purpose I/O bus contains 28 pins. Of these pins, two are used for the UART serial interface (Tx and Rx at a speed of 38,462 baud) and three for the serial boot EEPROM. Five pins can also be configured as Ethernet status indicators. Seven pins are used to support the PCMCIA mode of the expansion bus. Four of the GPIO pins can be used as chip selects when used with the expansion bus.

Expansion Bus

The expansion bus can support 8-bit Motorola, 16-bit Intel or 16-bit multiplexed modes. Helium 200 also has extended modes supporting i960 and PCMCIA-master. The expansion bus is also used to control external devices and boot the Helium 200 communications processor from memory, typically Flash PROM. Up to 4 GPIO pins can be used as programmable chip selects.

Boot Options

- USB interface
- UART
- Flash PROM
- Ethernet Network Boot

Software

Helium 200's Protocol Processor runs GlobespanVirata's extensive networking software suite, including:

- ATM device driver
- IP routing and bridging
- PPTP, L2TP
- RFC1483 PVC/SVC
- Classical IP PVC/SVC
- PPP over ATM PVC/SVC
- SSCOP, Q.2931
- UNI 3.0, 3.1, 4.0 signaling
- SNMP, TFTP, telnet, BOOTP
- AAL 0, AAL 2, AAL 5 SAR
- ATM pacing, policing and OAM
- ATMOS™, lightweight RTOS

See latest ISOS datasheet for full list of Software features.

Package

- 272 PBGA

Ordering Information

- **VC3220-PBC**
  60 MHz clock
  Supply 3.3V, +/- 10%
  Temperature range 0 C to +70 C
- **VC3220-PBI**
  60 MHz clock
  Supply 3.3V, +/- 5%
  Temperature range -40 C to +80 C
- The development system for Helium 200 is the BD6200.
- Databook available on request.

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