Atlanta™ 100 . . . .

- **High Performance Router**
- **Integrated 200 MHz MIPs Processor and 200 MHZ Voice DSP**
- **Robust Voice/Firewall/VPN/Router Stack**
- **Hardware Encryption Accelerator**
- **Hardware Packet Acceleration Engine**
- **Enhanced IPQoS**
- **PCI WiFi Ready**
- **Two 10/100 Ethernet MAC interfaces (enables port based DMZ)**

the edge in broadband™

VoIP service offerings are accelerating around the world as broadband subscribers start to take advantage of increased bandwidth. The total number of worldwide broadband (DSL, cable and other forms of access) subscriptions are predicted to be in the hundreds of millions over the next few years. Broadband service providers and subscribers are rapidly migrating to VoIP in significant volumes.

The Atlanta™ 100 chip family addresses the needs of telecommunication operators and service providers by enabling them to differentiate their offerings through superior voice-quality and next-generation telephony features, while outlining a roadmap that enables a smooth transition to the fully-integrated VoIP network of the future. The level of voice-quality and features incorporated into the Atlanta 100 enables service providers to increase their revenue opportunities by offering consumers a toll-quality VoIP experience with advanced features such as global phone number portability, virtual phone numbers, iron clad security, superior echo cancellation and a host of other new features not available with traditional phone service. In turn, consumers will be able to enjoy the benefits of economical, go-anywhere telephony combined with a wide variety of powerful calling features.

System Architecture
Atlanta 100 is a highly integrated product that combines a management processor, a voice engine, and a data engine specifically designed for residential gateways, MTA (media terminal adapter), and IADs (integrated access devices). Its design integrates a high-performance network processor, two RMII interfaces, a voice DSP (digital signal processor), a USB interface, and dual PCM/IOM2 interfaces.

Integrated Network Processing
An integrated RISC processor (network processor) performs initialization, network management, data routing, NAT/PAT, and other functions. The system includes extensive DMA resources and an efficient memory controller that supports from 8 Mbytes up to 32 Mbytes of 100-MHz SDRAM. To minimize network-processing overhead, the hardware DMA controllers include state machines that work directly with high-level data structures (packet descriptor queues).

Voice Functionality
Atlanta 100 integrates a DSP core for voice processing. The DSP core has four execution units with VLIW (very-long instruction word) architecture, an 8-Kbyte Instruction-cache, a 16-Kbyte Data-cache, and is supported by DMA and hardware messaging facilities. The DSP firmware is included with extensive voice compression and processing capabilities. The software library for Atlanta 100 provides a rich set of APIs for DSP, QoS, and full-suite RTP/RTCP protocol stack.

VPN Functionality
Atlanta 100 can manage VPNs (virtual private networks) it is a scalable solution that requires limited configuration on the nodes that make use of the VPN for exchanging data.

Atlanta 100 is a device that supports the following three major VPN modules:
- IPSec (Internet protocol security)
- IKE (Internet key exchange)
- L2TP (Layer 2 tunneling protocol for VPNs)

The IPSec module supports DES, 3DES, and AES encryption, as well as SHA1 and MD5 hashing in hardware.

Packet Header Processor
The PHP (packet header processor) assists the network processor by off-loading many of the routine packet pre-processing tasks. Many of these packet pre-processing tasks are not only done faster, but are done using an independent packet processor, which frees up CPU cycles.

Physical Interfaces for Applications
Atlanta 100 integrates two 10/100 Ethernet MAC ports with standard RMII interfaces (one configurable MII interface for one MAC is also available). These ports enable Atlanta 100 to interface with any other LAN PHY device that is compatible with the RMII standard interface. The network processor manages the receive and transmit queues, and the routing between the Ethernet ports. Atlanta 100 provides two selectable IOM or PCM highway interfaces (60 timeslots) for voice processing and TDM (time-division multiplexing) interfaces. The Atlanta 100 DSP core voice-engine can tap into any combination of timeslots. Atlanta 100 provides a dual-mode host bus that can interface with both PCI and PC Card peripheral devices. Most 802.11a, 802.11b, and 802.11g devices can be interfaced directly to Atlanta 100 with zero glue logic. The chip contains a fully integrated USB version 1.1 device interface.

32-bit PCI and 16-bit PCMCIA Interface
Atlanta 100 provides a shared address, data bus, and dedicated control signals for both the PCI Cardbus and PCMCIA. The Atlanta 100 also supports up to 16 MB of 16-bit parallel flash memory.

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Features

- **Atlanta 100 integrates**
  - Network processor
  - Voice DSP and codec
  - Packet acceleration engine
  - Hardware AES, DES, and 3DES encryption engine
  - VPN
  - PCI
  - USB
  - Network interfaces (two Ethernet MACs)
- **Data support**
  - Integrated RISC processor: 200 MHz MIPS with 16-Kbytes instruction cache, 8-Kbytes data cache, 32-Kbytes boot RAM, and MMU
  - Hardware AES, DES, 3DES, MD5, and SHA-1 encryption engine
  - Two 10/100 Ethernet MAC interfaces with standard RMII
  - USB 1.1 slave interface
  - Hardware traffic shaping for eight VCCs
  - Packet-level traffic shaping as well as classification and marking for IPQoS support
  - Packet header co-processor with ingress queuing for fast incoming traffic preprocessing and TCP/IP functionality offload as well as IPQoS
  - Hardware support for VCC demultiplexing ATM
  - RFC 1483/RFC 2684 (routing or bridging; LLC or VC multiplexing)
  - PPP-over-ATM (RFC 2364)
  - CBR/UBR/UBR with PCR Shaping/VBR-rt/VBR-nrt
  - Eleven VCCs supported in hardware, additional VCCs supported in software
  - I.610 OAM F4/F5 loopback/AIS/RDI/continuity check
  - ILMI and support for TR037
  - RFC1577/RFC 2225 (classical IP over ATM) data networking and management
  - SNMP v1/v2 (ADSL/ATM/MIB2)
  - NAPT with over 50 ALGs
  - TCP/IP with RIP1 and RIP2 (RFC 1058, RFC 1389)
  - DHCP server and client (RFC 2131)/DHCP relay
  - DNS
  - Stateful inspection firewall
  - Integrated VPN and firewall for highest performance and security
  - PPPoE (RFC 2516)
  - PPP (RFC 1661, RFC 1144)
  - 802.1d transparent bridging protocol
  - Embedded http server
  - FTP server/client
  - TFTP client/server
  - SNTP protocol
  - IGMP proxy (v1/v2/v3)
  - Bootp
  - Telnet
 - SMTP/log/onboard flash log
- **Voice features**
  - Integrated DSP Processor: VLIW architecture 200 MHz voice DSP supports up to four channels of deep compression codecs
  - Supports one FXO and four FXS channels
  - G.711 (PCM), G.729a/b, G.726-32, and G.723.1 AMR narrowband codes
  - Supports generic VAD (voice activity detection) and CNG (comfort noise generation)
  - G.711 fax/modem pass-through (fax/modem detection and reversion to PCM 64 kbps)
  - Supports caller ID, including JCLIP

  - Supports call forwarding and call waiting
  - G.168 echo cancellation with programmable echo tail length from 8-28 ms
  - DTMF tone generation and detection Q.21/Q.23/Q.24
  - Adaptive and configurable jitter buffer with maximum size of 300 ms
  - T.38 Fax Relay
  - Message waiting indicator and call hold
  - Pulse dialing
  - Dual FXS or FXS/FXO modes
  - Meets G.711-G.712 and wideband G.722.2 ITU-T requirements
  - Programmable ring generation
  - Integrates two comparators with programmable hysteresis and threshold for line monitoring
  - Ring and hook detection circuit
  - Polarity reversal detection
  - Record and play announcements per channel
- **Interfaces and memory**
  - 16-bit PC Card and 32-bit PCI
  - SPI interface with four chip selects for serial, flash, Ethernet switches, and SLIC/SLACs
  - PCM/IOM2 interface with programmable time slots
  - Boot loading and configuration using either parallel flash on PC Card bus, serial flash on SPI bus, or external host on PCI bus
  - Supports 8-, 16-, or 32-M bytes of SDRAM
  - Support for 16/32-bit wide SDRAM memory
  - Two integrated Ethernet MACs with industry standard RMII interface
  - USB 1.1 slave

Atlanta 100 Processor and Data/Security/Voice Engine
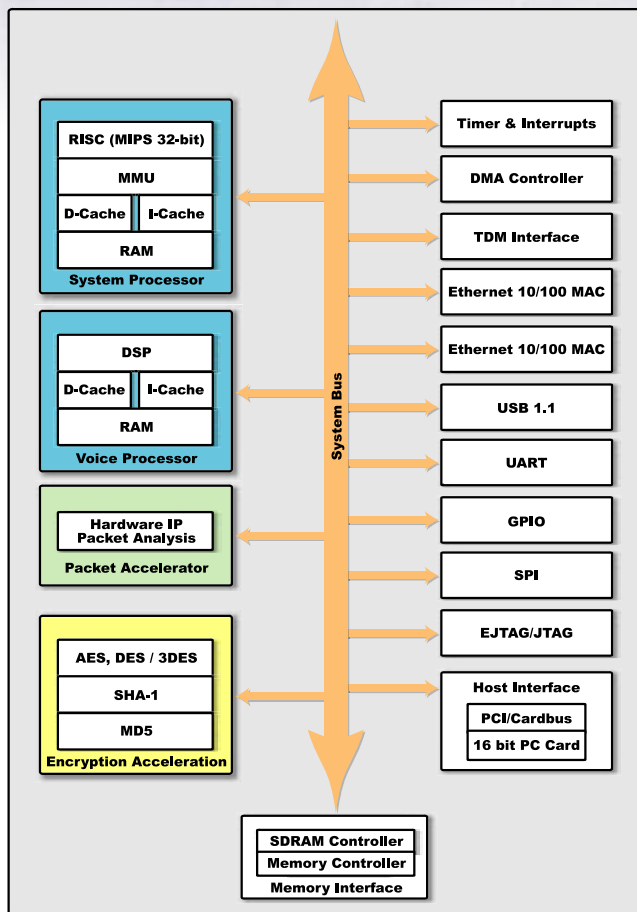
Part Ordering Information

Product	Part Number	Package
Atlanta 100 1-Ch Voice	CT-A10RN01-PJ	256-pin LBGA
Atlanta 100 2-Ch Voice	CT-A10RN02-PJ	256-pin LBGA
Atlanta 100 4-Ch Voice	CT-A10RN04-PJ	256-pin LBGA

VoIP Codec IDs	
A	G.711 & G.726
B	G.711, G.726, G.723.1 & G.729AB
C	G.711, G.726 & G.723.1
D	G.711, G.726 & G.729AB

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