

## 2 21164 Alpha Microprocessor Features

The 21164 has the following features:

- Fully pipelined 64-bit advanced RISC architecture supports multiple operating systems, including:
  - Microsoft Windows NT
  - DIGITAL UNIX
  - OpenVMS
- 366-MHz through 500-MHz operation
- Superscalar 4-way instruction issue
- High-bandwidth (128-bit) interface
- Peak execution rate of 1.7 BIPS
- 0.35- $\mu$ m CMOS technology
- Three onchip caches:
  - 8KB, direct-mapped, L1 instruction cache
  - 8KB, dual-ported, direct-mapped, write-through L1 data cache
  - 96KB, 3-way, set-associative, write-back L2 data and instruction cache
- Supports optional board-level L3 cache ranging from 1MB to 64MB
- Supports byte and word data types
- 3.3-V external interface and 2.5-V internal interface

The 21164 implements IEEE S\_floating and T\_floating, and VAX F\_floating and G\_floating data types, and supports longword (32-bit) and quadword (64-bit) integers. It also provides byte (8-bit) and word (16-bit) support by byte-manipulation instructions. Limited hardware support is provided for the VAX D\_floating data type.