DECchip 21064 and DECchip 21064A Alpha AXP PCI Evaluation Board

Product Brief

April 1994

digital

Description

The DECchip 21064 and DECchip 21064A Evaluation Board (EB64+) is an evaluation and development module for computing systems based on the DECchip 21064 (21064) or DECchip 21064A (21064A). The EB64+ provides a single-board hardware and software development platform for the design, integration, and analysis of supporting logic and subsystems. The board also provides a platform for PCI I/O device hardware and software development.

Features

- DRAM memory subsystem includes:
  - 16-MB to 512-MB memory with 128-bit data path
  - Commodity single in-line memory modules (SIMMs):
    - Each SIMM is 36 bits wide (32 data bits, 1 parity bit, 3 unused bits), with 70 nsec or less access
    - The following SIMM sizes are supported:

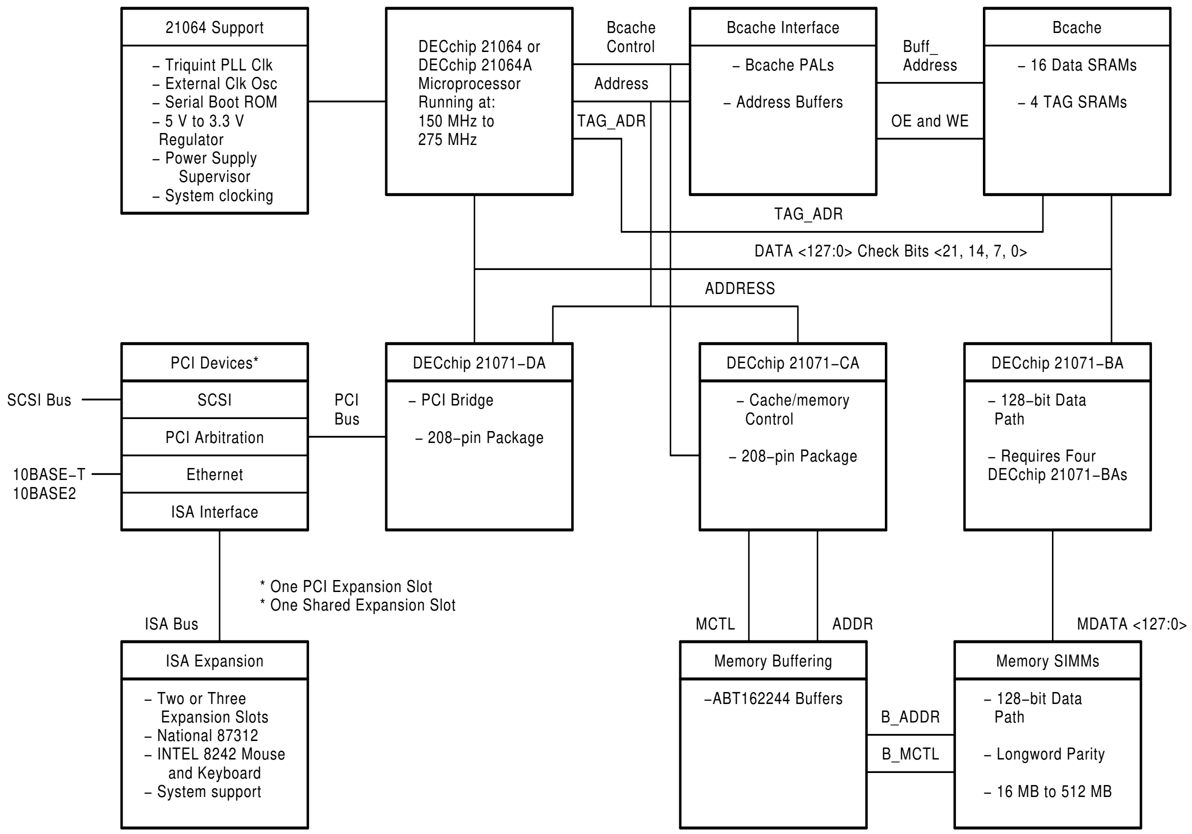
      1 MB x 36
      2 MB x 36
      4 MB x 36
      8 MB x 36
      16 MB x 36
- Bcache subsystem supports:
  - 128-bit data path
  - 512-kB, 1-MB, or 2-MB cache sizes
  - Bcache supports twelve 128K x 8 SRAMs and four 128K x 9 SRAMs (15 nsec access)
  - Cache tag supports: 4, 64K x 4 SRAMs (15 nsec access)
- PCI Support
  - Selectable PCI speed between 25 MHz and 33 MHz
  - PCI to ISA bridge through an Intel 82378ZB or 82378IB Saturn-I/O chip
  - Ethernet link provided by a DECchip 21040 PCI to Ethernet chip supporting 10BASE-T (twisted pair) and 10BASE2 (ThinWire)
  - NCR 53C810 chip provides a SCSI interface
  - One dedicated PCI slot
  - One shared slot with ISA
- ISA provides an expansion bus and the following system support functions:
  - Mouse and keyboard controller functions provided through an Intel 8242
  - National 87312 used as the combination chip providing a floppy disk controller, two universal, asynchronous receiver/transmitters (UARTs), and a bidirectional parallel port
  - Time of year (TOY) function provided by a DS1287A chip
  - 8-kB nonvolatile RAM for operating system support provided by a DS1225Y chip
  - Two dedicated expansion ISA slots
  - One shared expansion slot with PCI
- Software support includes industry-standard 512-kB UVPROM containing debug monitor code. Source code listings for all software (including SROM, boot, diagnostic ROM monitor) are provided. The monitor provides the following functions:
  - Download files through serial and Ethernet ports and diskette
  - Load data from a ROM through the debug monitor

- Examine and deposit the EB64+ system register, 21064 and 21064A IPRs, and I/O mapped registers
- Examine and modify DRAM and I/O mapped memory
- Disassemble CPU instructions in memory
- Transfer control to programs in memory
- Perform native debugging including breakpoints and single stepping
- Perform full source level debugging using DECladebug that runs on a host and communicates through an Ethernet connection
- Development code can be generated on a host system and loaded into the EB64+ through the serial line, Ethernet port, diskette, or ROM socket
- Full design database and user documentation

Microarchitecture

The EB64+ is implemented using industry-standard parts. The major functional board components include:

- 21064 or 21064A CPU running at 150 MHz to 275 MHz
- A 6-chip ASIC set (DECchip 21072-AA chipset) containing control logic and interfaces between the CPU, main memory, Bcache, and PCI and includes: cache and memory controller, PCI interface (I/O bridge), and a 128-bit memory interface
- PAL control set includes:
  - Two 20V8-5 PALs provide Bcache output enable and write enable functions
  - One 22V10-10 PAL and one 22V10-15 PAL provide PCI arbitration
  - One Mach 210-20 PAL provides PCI and ISA device interrupt service
- DRAM memory in two banks of four commodity SIMMs
- Three dedicated expansion slots, and one shared expansion slot
- Interface to industry-standard ISA bus
- Two 100-pin on-board connectors support a frame buffer. Buffer resides on the memory bus and supports a 128-bit interface.



eb–block.eps–x.64–y.75

Applications

The EB64+ allows designers with no previous Alpha AXP experience to perform:

- 21064- or 21064A-based system development
- Software development
- I/O device development (PCI and ISA)
- Memory and Bcache subsystem development

Support Documentation and Software Tools

The EB64+ is supported with the following documentation and software tools:

- User documentation
- Sources for SROM and debug ROM
- Software development tools for a Windows NT or DEC OSF/1 host platform
- Circuit schematics
- Board artwork
- Circuit design database compatible with Viewlogic Systems, Inc., Powerview 5.1.1
- ABEL and JEDEC files for PLDs
- Hardware design application notes

EB64+ Characteristics

Characteristics	Specifications
Power Supply	User supplied, industry-standard PC power supply
Operating Temperature	15°C (59°F) to 32°C (90°F)
Storage Temperature Range	-55°C (-67°F) to 125°C (257°F)
Size	30.48 cm (12.0 in) x 33.02 cm (13.0 in)

For More Information

To learn more about the availability of the EB64+ Evaluation Board, contact your Digital sales representative, or, in the United States, call our DECchip Information Line:

1–800–DEC–2717
1–800–DEC–2515 (TTY)

Outside North America, call:

+1–508–568–6868

While Digital believes the information included in this publication is correct as of the date of publication, it is subject to change without notice.

EC–N0639-72