

DECchip 21064 and DECchip 21064A Alpha AXP PCI Evaluation Board

Product Brief

April 1994



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 sub-systems. 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 UVROM 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

Preliminary Information

- 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

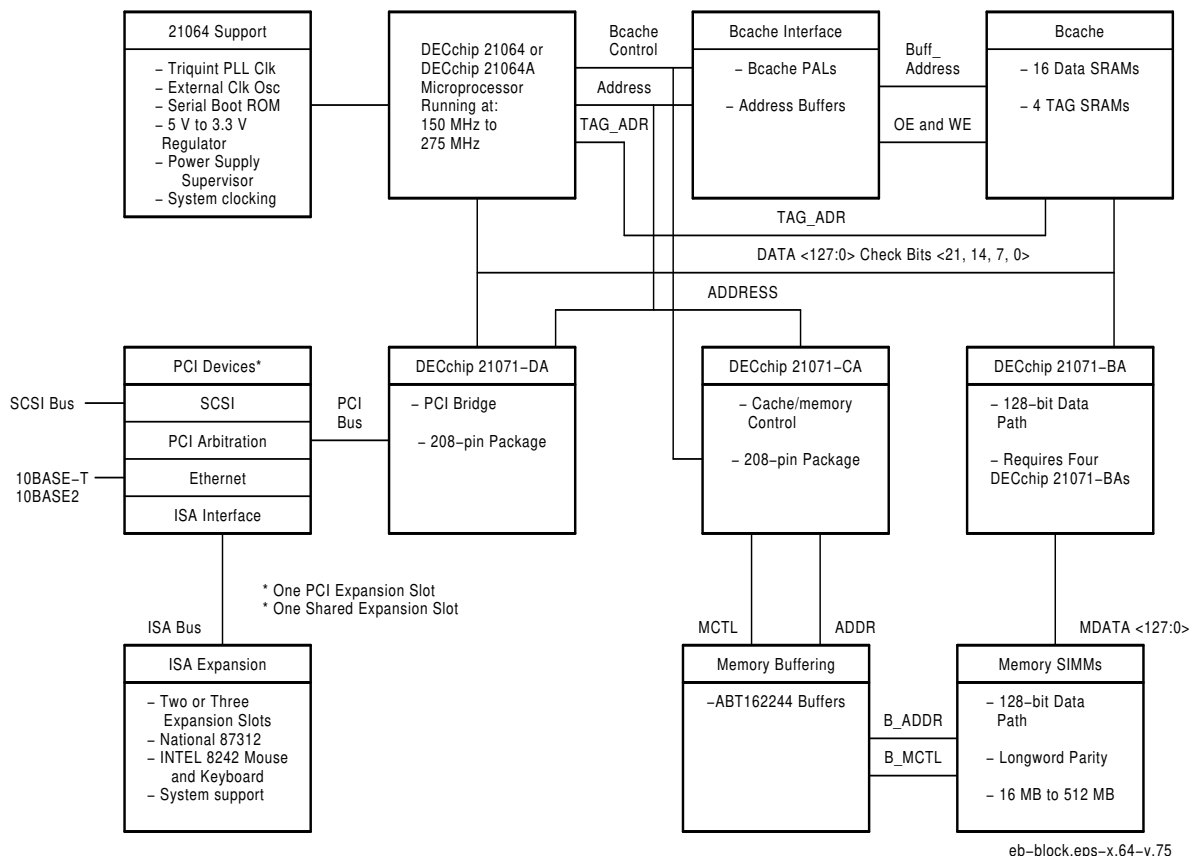
Microarchitecture

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.



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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

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