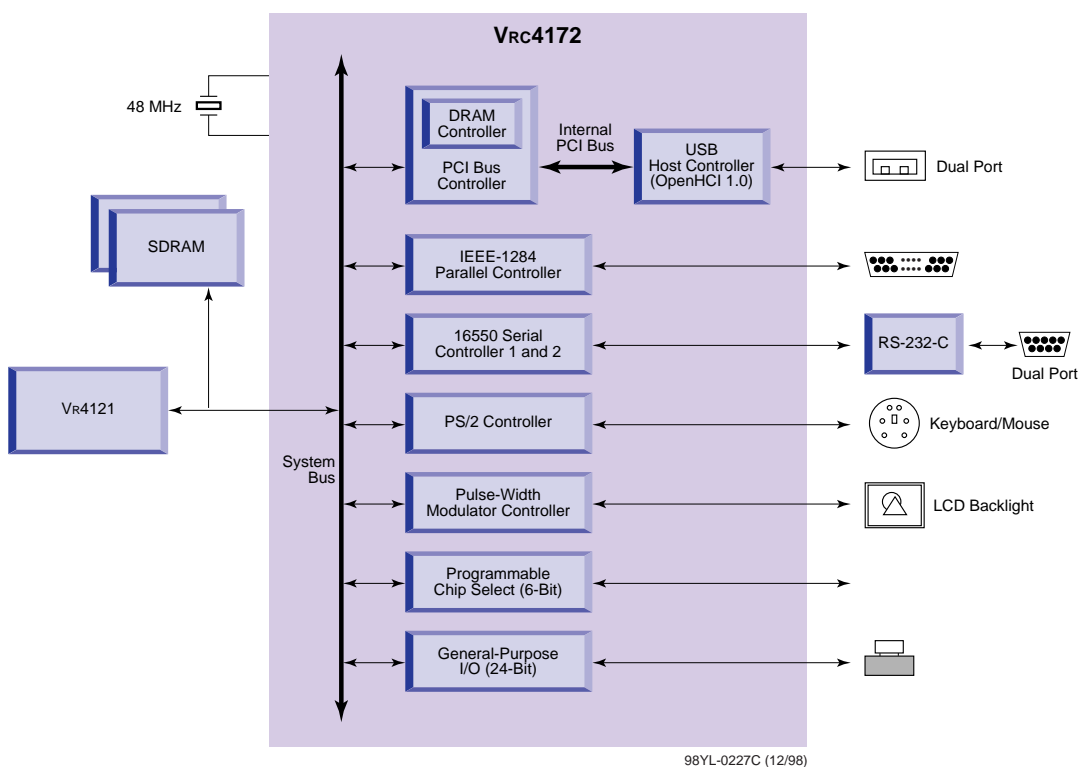


VRC4172 COMPANION CHIP FOR VR4121 MICROPROCESSOR

The VRC4172™ companion chip to NEC's VR4121™ MIPS® RISC microprocessor is designed for high-end Windows® CE Handheld PC Professional applications. The VR4121 microprocessor functions as the host CPU, while the VRC4172 supplies the SDRAM interface, USB interface, host- and peripheral-selectable IEEE-1284 parallel interface, 16550-compliant serial interface, PS/2 interface, general-purpose I/O ports, general-purpose chip select signal, and pulse-width modulation for the LCD back light.

In combination, the VR4121 and VRC4172 offer an excellent performance/cost solution for next-generation Windows CE applications, forming a superior engine for most, if not all, high-performance Windows CE-based handheld products.

BLOCK DIAGRAM



ORDERING INFORMATION

PART NUMBER
VRC4172

PACKAGE
256-pin TBGA

FEATURES

PROCESSOR INTERFACE

- 32-bit LCD interface
- 16-bit mini-ISA bus interface (as defined by Vr4121)
- DRAM interface and SDRAM controller for DMA/master mode

USB HOST CONTROLLER

- OpenHCI USB 1.0 compliant
- Standard communication with USB device; asynchronous communication with host CPU
- Full-speed (12 Mbps) and low-speed (1.5 Mbps) operation
- 48-MHz system clock
- On-chip FIFO
 - PCI read: 4 x 4 Dword
 - PCI write: 4 x 4 Dword
 - USB side: 64 x 1byte
- Two downstream ports
- No support for legacy interface

IEEE1284 PARALLEL PORT INTERFACE

- ECP, EPP, SPP, and P1284 host function with DMA operation
- Device function operation

SERIAL PORT INTERFACE

- Two 16550-compatible serial interfaces

PROGRAMMABLE CHIP SELECT AND GENERAL-PURPOSE I/O

- Six chip selects
- 24 general-purpose I/O (GPIO) signals

PS/2 INTERFACE

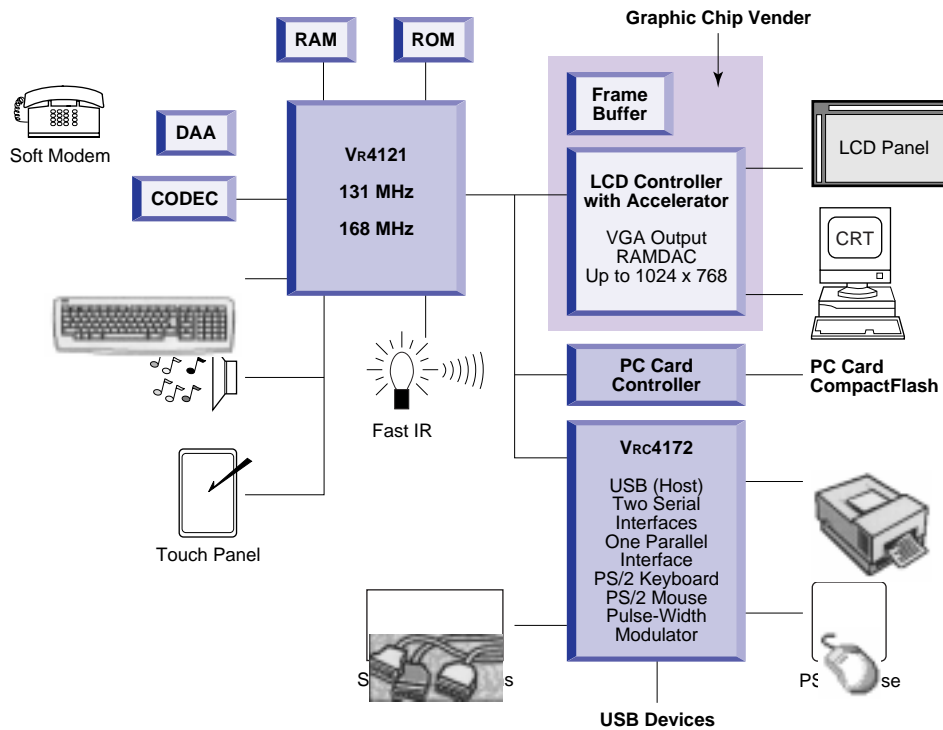
- PS/2 keyboard and mouse support

PULSE-WIDTH MODULATION (PWM) FOR LCD BACKLIGHT

PACKAGE

- 256-pin TBGA (27 mm square)

SAMPLE WINDOWS CE H/PC PROFESSIONAL IMPLEMENTATION



NEC

For literature, call 1-800-366-9782 7 a.m. to 6 p.m. Pacific time
or fax your request to 1-800-729-9288
or visit our Web site at www.necel.com

© April 1999 NEC Electronics Inc. NEC, Vr Series, Vrc4121, Vr4172 are either trademarks or registered trademarks of NEC Corporation in the United States and/or other countries. Windows and Windows CE are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries. All other trademarks are the property of their respective owners. No part of this document may be copied or reproduced in any form or by any means without the prior written consent of NEC Electronics Inc. (NECEL). The information in this document is subject to change without notice. ALL DEVICES SOLD BY NECEL ARE COVERED BY THE PROVISIONS APPEARING IN NECEL TERMS AND CONDITIONS OF SALES ONLY, INCLUDING THE LIMITATION OF LIABILITY, WARRANTY, AND PATENT PROVISIONS. NECEL makes no warranty, express, statutory, implied, or by description, regarding information set forth herein or regarding the freedom of the described devices from patent infringement. NECEL assumes no responsibility for any errors that may appear in this document. NECEL makes no commitments to update or to keep current information contained in this document. The devices listed in this document are not suitable for use in applications such as, but not limited to, aircraft control systems, aerospace equipment, submarine cables, nuclear reactor control systems, and life-support systems. "Standard" quality grade devices are recommended for computers, office equipment, communication equipment, test and measurement equipment, machine tools, industrial robots, audio and visual equipment, and other consumer products. For automotive and transportation equipment, traffic control systems, and anti-disaster and anti-crime systems, it is recommended that the customer contact the responsible NECEL salesperson to determine the reliability requirements for any such application and any cost adder. NECEL does not recommend or approve use of any of its products in life-support devices or systems or in any application where failure could result in injury or death. If customers wish to use NECEL devices in applications not intended by NECEL, customers must contact the responsible NECEL salespeople to determine NECEL's willingness to support a given application.

Document # U14034EU2V0P800