

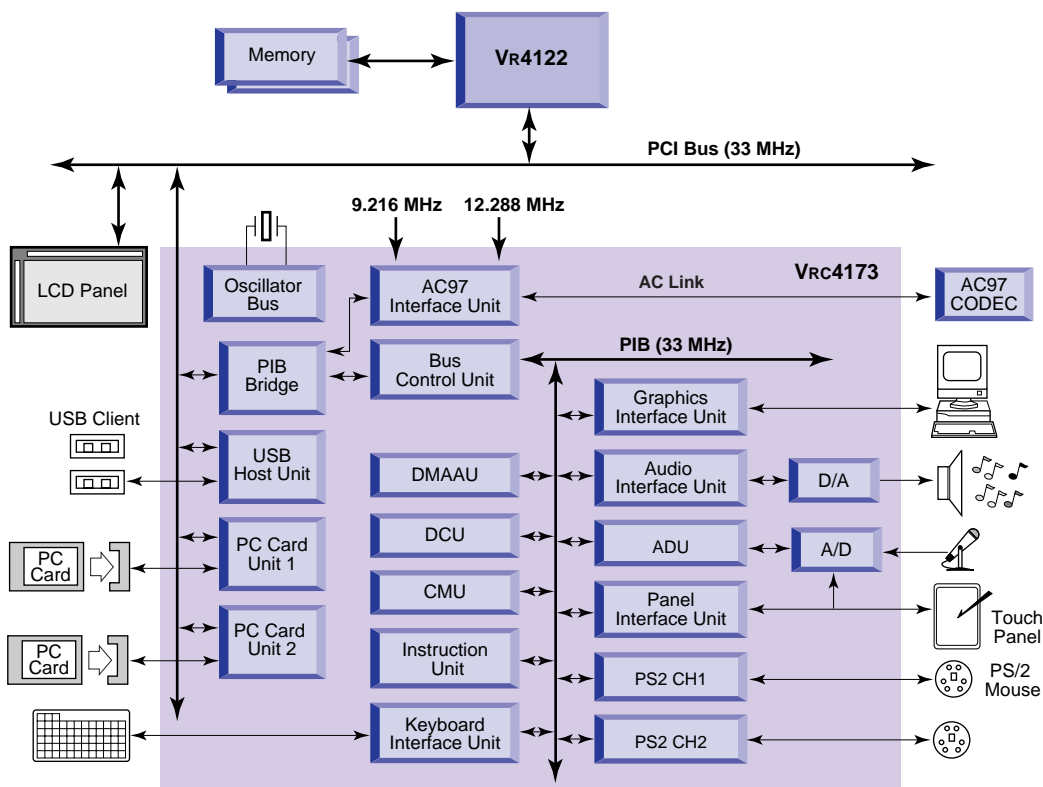
## VRC4173 COMPANION CHIP

### FOR WINDOWS CE

The VRC4173™ is a companion chip designed to be used with NEC's VR4122™ 64-bit MIPS® RISC microprocessor. The VRC4173 incorporates the I/O macros necessary for a handheld PC running Microsoft® Windows® CE, and can also access design resources on a personal computer by means of the PCI bus interface. With the VR4122 acting as the host CPU, the VRC4173 functions include PCI bus interface, USB host controller, two-slot PC Card™ controller, AC97 interface, keyboard controller, 10-bit D/A converter, 12-bit A/D audio controller, touch panel controller, general-purpose I/O pins, and built-in 48-MHz oscillator.

The VR4122 and VRC4173 provide an excellent performance/cost solution for Windows CE H/PC Pro applications. They also form an ideal engine for most high-performance Windows CE-based handheld products.

### BLOCK DIAGRAM



NEC's VRC chipsets are designed for use with NEC VR Series microprocessors. NEC makes no claim as to the suitability of VRC chipsets for use with non-NEC microprocessors and does not warrant their performance, suitability or use in such applications.

## FEATURES

### PCI BUS PROCESSOR INTERFACE

- 32-bit PCI Bus operating at 33 MHz
- CLKRUN signal support

### USB HOST CONTROLLER

- Compliant with OpenHCI release 1.0 specification
- Two-port, two-speed (12 Mbps, 1.5 Mbps)
- Built-in FIFO
  - PCI read cycle = 4 x 4 Dwords
  - PCI write cycle = 4 x 4 Dwords
  - USB side = 64 x 1 byte

### PC CARD CONTROLLER

- Compliant with the 1997 PC Card standard
- Two PC Card slots
- Buffer with a 5-volt withstand voltage
- Interface for an external power supply control IC

### AC LINK INTERFACE

- AC link conforming to the audio codec (AC97) standard, rev. 2.1
- DMA support

### KEYBOARD CONTROLLER

- 96-key keyboard
- VR4121 keyboard interface unit-compatible

### AUDIO CONTROLLER

- Reproduction: 10-bit D/A converter
- Recording: 12-bit A/D converter
- VR4121 audio interface unit-compatible

### TOUCH PANEL CONTROLLER

- Touch panel driver, coordinate detection (12-bit A/D converter)
- One general-purpose analog input port
- VR4121 panel interface unit-compatible

### GENERAL-PURPOSE I/O PINS

- Total of 21 pins
- VR4121 general-purpose I/O interface unit-compatible

### MISCELLANEOUS

- Built-in 48-MHz oscillator with 48-MHz clock output
- CB-C9VX (UC1H) process
- 3.3-volt, single-voltage power supply (some internals with 5.0-volt withstand voltage)
- 304-pin FPBGA package (19 x 19 mm, 0.8-mm pitch)

## ORDERING INFORMATION

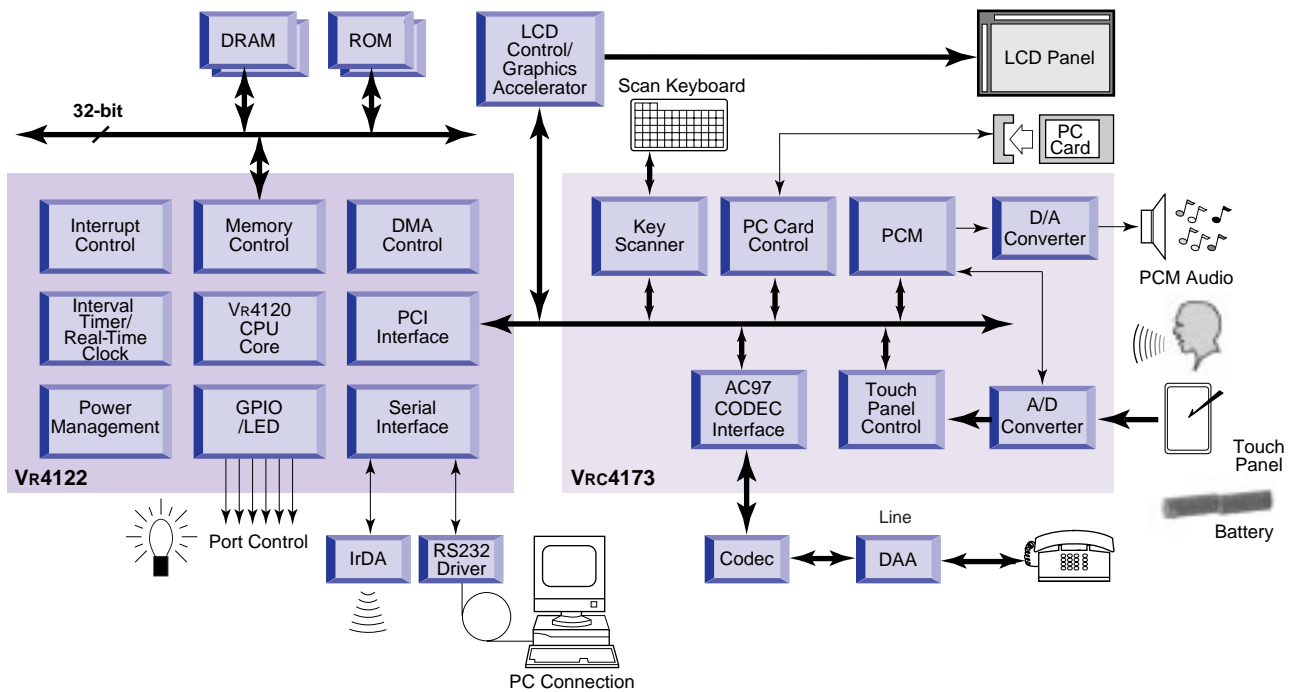
### PART NUMBER

μPD31173F1-33-H/N

### PACKAGE

304-pin FPBGA (19x19mm)

## EXAMPLE HANDHELD PC PRO APPLICATION USING VR4122 WITH VRC4173





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or fax your request to **1-800-729-9288**  
or visit our Web site at **[www.necel.com](http://www.necel.com)**

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