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.

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  PACKAGE
µPD31173F1-33-H/N  304-pin FPBGA (19x19mm)
EXAMPLE HANDHELD PC PRO APPLICATION USING Vr4122 WITH Vrc4173