

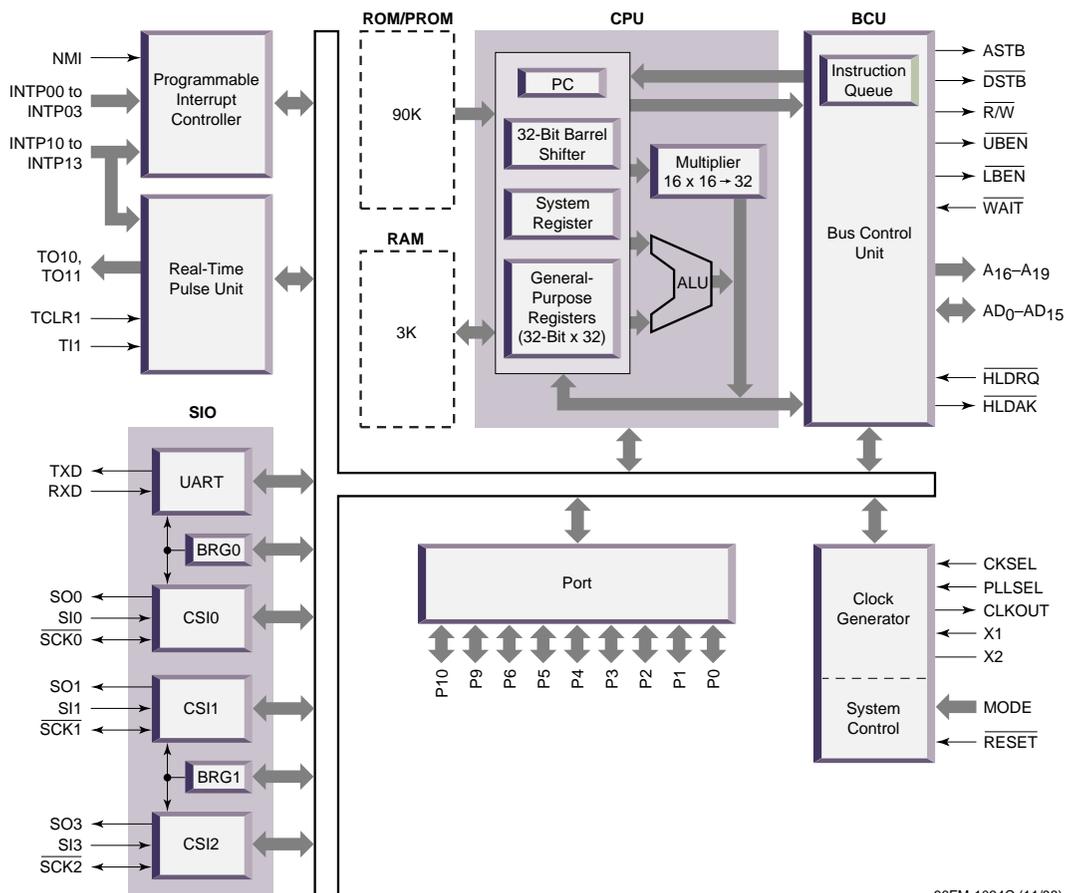
V852™ 32-BIT RISC MICROCONTROLLER

The high-speed V852 microcontroller features the high-performance 32-bit RISC engine of NEC's V850™ family and targets low-power designs with large embedded code. The device has nearly three times the on-chip memory of the V851™ (90K versus 32K of ROM and 3K versus 1K of RAM). Many versions of the V850 core are available as part of NEC's ASIC library. The architecture of the V852 device is highly optimized for fast DSP-like operation and very efficient implementation of C programmability.

SPECIFICATIONS

- Clock frequency: DC to 25 MHz
- Performance
 - 29 Dhrystone MIPS
 - 133 MIPS/W
- Two-cycle MAC instruction
- 5V operation
- Power consumption: 217 mW at 25 MHz
- 0.5- μ m CMOS process technology
- 6.15 mm x 6.15 mm die size
- Package
 - 100-pin plastic QFP
 - 14 mm x 14 mm

BLOCK DIAGRAM



FEATURE DESCRIPTION

CPU

- **Highly integrated microcontroller**
 - 32-bit arithmetic logic unit (ALU)
 - Thirty-two general-purpose 32-bit registers
 - 32-bit barrel shifter
- **Single-cycle 16 x 16 → 32-bit hardware multiplier**
- **Powerful RISC instruction set**
 - 74 RISC instructions: 16- and 32-bit
 - Two-cycle MAC function for DSP applications
 - Saturated operation instructions (overflow/underflow detection function)
 - Single-cycle 32-bit shift instructions
 - Bit manipulation instructions
 - Load and store instructions with 8-/16-/32-bit data
- **Fast instruction execution: 40 ns at 25 MHz**

MEMORY

- **90K single-cycle internal ROM or PROM**
- **3K single-cycle internal RAM**

EXTERNAL BUS INTERFACE

- **16-MB linear external memory expansion**
- **Multiplexed 24-bit address/16-bit data bus**
- **Programmable and external wait functions**
- **Idle state insertion for slow memory**
- **Multiple bus mastership**

INTERRUPTS

- **16 maskable interrupts plus NMI**
- **Eight programmable priority levels on all interrupts and traps**
- **Specifiable rising and/or falling edge detection**
- **32 software traps**

PERIPHERALS

- **68 general-purpose, reassignable I/O pins**
- **Real-time pulse unit**
 - 16-bit timer/event counter with four 16-bit capture/compare registers
 - 16-bit interval timer
- **Serial interface**
 - UART
 - Clocked serial interface: three channels
 - Dedicated baud rate generator: two channels
- **Clock generator**
 - Internal PLL (5x or 1x)
 - Direct clock input ($1/2x$)

OTHER

- **Power saving features**
 - Halt/idle/stop modes
 - Clock output stop function
 - Fully static operation

ORDERING INFORMATION

PART NUMBER	INTERNAL ROM	PACKAGE
μ PD70P3002GC-25-7EA	90K OTP PROM	100-pin plastic QFP (fine pitch), 14 mm x 14 mm
μ PD703002GC-25-xxx-7EA	90K masked ROM	100-pin plastic QFP (fine pitch), 14 mm x 14 mm

Note: xxx indicates ROM code suffix.



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.nec.com**

© 1998 NEC Electronics Inc. NEC, V850, V851 and V852 are either trademarks or registered trademarks of NEC 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.