

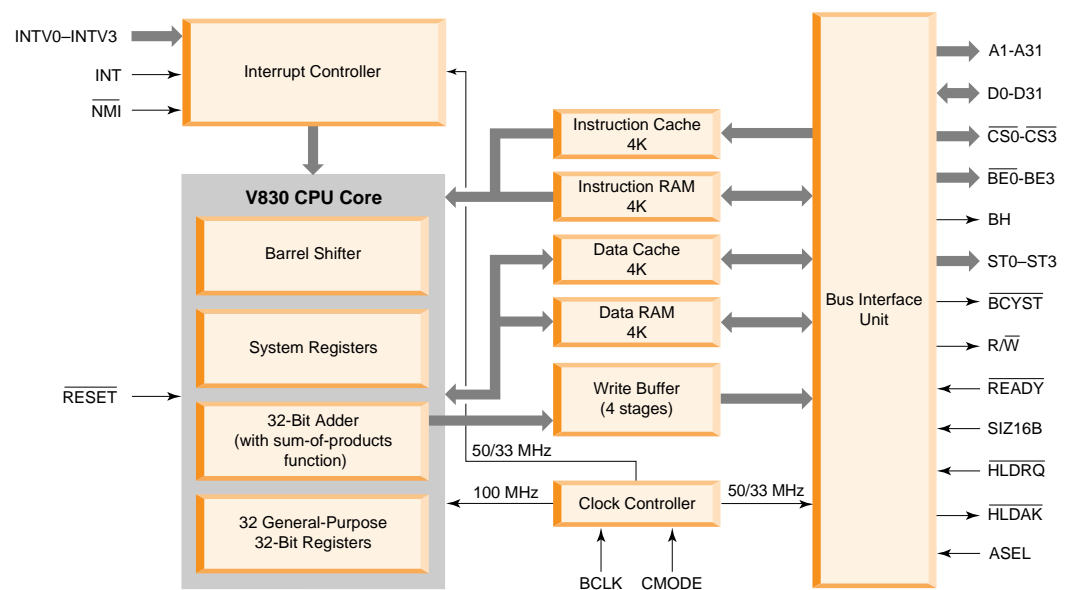
V830™ 32-BIT RISC MICROPROCESSOR

The V830 microprocessor is the first member of NEC's V830™ family of 32-bit RISC microcontrollers. The high-performance, low-power V830 microprocessor with DSP features and on-chip caches is ideally suited for low-cost embedded applications. The high processor bandwidth allows the V830 to target multimedia applications such as JPEG decoding and Internet-based information appliances. DSP functionality is provided with a 32-bit hardware barrel shifter and a single-cycle, multiply-and-accumulate (MAC) instruction executing up to 200 million operations per second (MOPS).

SPECIFICATIONS

- Clock frequency: 33 to 100 MHz
- Performance
 - 118 Dhrystone MIPS
 - 214 MIPS/W
- 32-bit single-cycle MAC instruction (200 MOPS)
- 32-bit external data bus
- 16-level maskable interrupts plus NMI
- Power consumption: 550 mW at 100 MHz at 3.3 V
- 0.35- μ m CMOS process technology
- 16K of instruction and data cache/RAM
- 3.3 volts VDD

BLOCK DIAGRAM



FEATURE DESCRIPTION

CPU

- 200-MOPS MAC instruction
- High-performance microcontroller
 - Five-stage pipeline control
 - Thirty-two general-purpose 32-bit registers
 - 64-bit barrel shifter
 - 32-bit MAC unit
- Powerful RISC instruction set
 - 102 16- and 32-bit RISC instructions
 - Single-cycle MAC instruction (32 bits x 32 bits → 64-bit result)
 - Saturated arithmetic operation (with saturation detection function)
 - One- and two-cycle double-word shifting (64-bit data)
 - High-speed lookahead branch
 - Block load/store instructions
- Fast instruction execution: 10 ns at 100 MHz

MEMORY

- 4K instruction cache (direct-mapping)
- 4K data cache (direct-mapping/write-through)
- 4KB instruction RAM
- 4KB data RAM
- 4-MB linear address memory space

EXTERNAL BUS INTERFACE

- Single and 16-byte burst transfer modes
- Separate 32-bit address and data buses
- 16-/32-bit data bus sizing
- Bus hold/lock
- Four chip select outputs

OTHER FUNCTIONS

- Sleep/stop modes
- 5V input-tolerant voltage buffer
- Internal clocks: by PLL (2x, 3x)

DEVELOPMENT TOOLS

- High-performance optimized C compilers (NEC, Green Hills, and MetroWerks)
- Real-time operating systems
- High-level language debugger with GUI
- ROM-ICE emulator
- Evaluation boards
- Middleware libraries
 - MH/MR/MMR
 - JBIG, JPEG, MPEG
 - SOFTMODEM
 - PCI/I²O™ compatibility

ORDERING INFORMATION

PART NUMBER

μPD705100GJ-100-8EU

PACKAGE

144-pin plastic QFP (fine pitch) 20 mm x 20 mm



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