NEC

µPD/8910x/911x/912x/913x
8-Bit General-Purpose Microcontrollers With 8- or 10-Bit A/D and RC or Ceramic Oscillator

K0S Family Product Brief

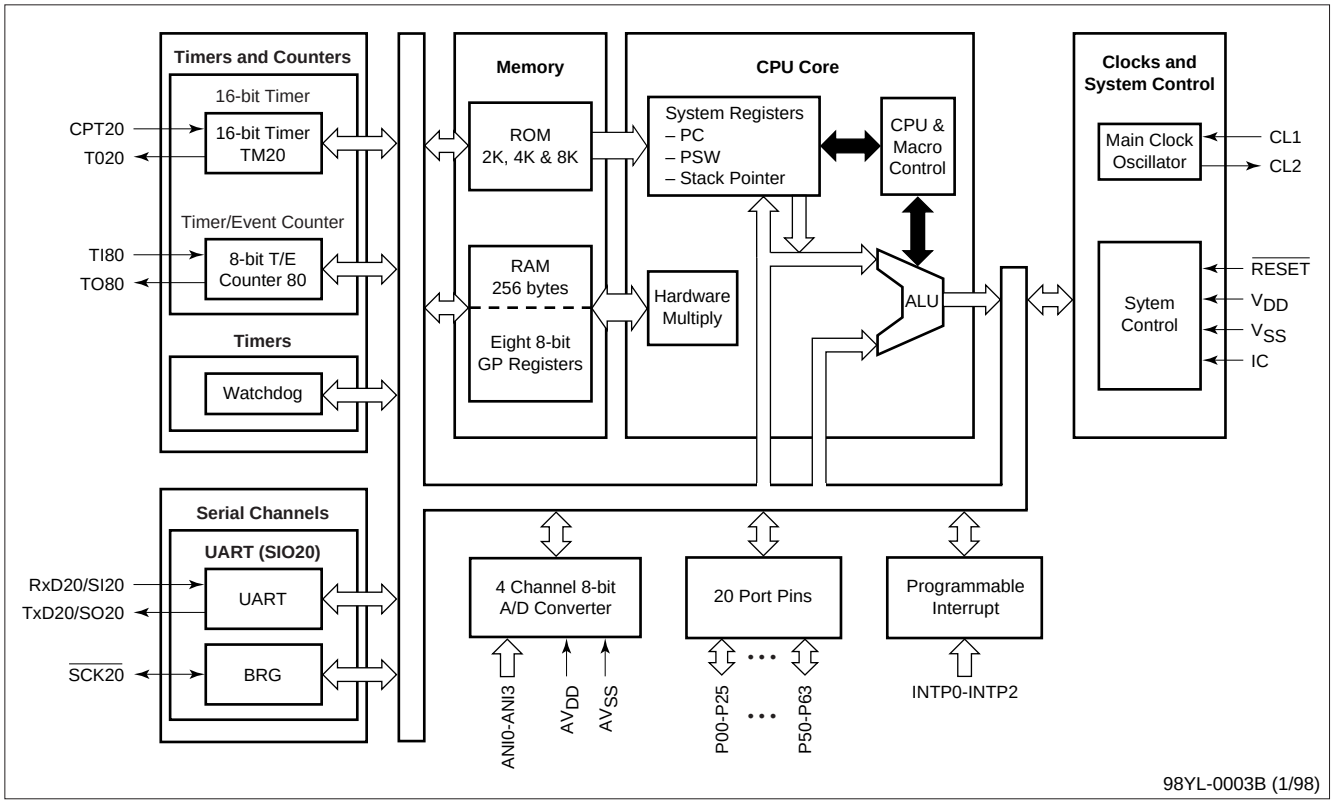
March 1998

Description

The µPD7891xx microcontrollers are new members of NEC's low-cost K0S 8-bit microcontroller family. They offer a system clock choice of an RC circuit or resonator, and are available with an 8- or 10-bit A/D converter. The µPD7891xx family is fabricated using an 0.35-micron CMOS process for low power consumption and minimal cost. With 28- or 30-pin package options, these devices are ideal for cost-sensitive consumer applications needing analog interfaces.

These microcontrollers are supported by an extensive tool chain, compatible across NEC's entire K Series® line of 8- and 16-bit microcontrollers. The tools contain a software simulator, C compiler, relocatable assembler, screen debugger, and in-circuit emulator.

Figure 1. Block Diagram



Specifications

- Clock frequency
  - RC oscillator up to 4 MHz
  - Ceramic oscillator up to 5 MHz
- Minimum instruction execution time
  - RC oscillator –0.5 µs
  - Ceramic oscillator –0.4 µs
- Operating voltage: 1.8 to 5.5 volts
- Operating temperature: –40 to +85°C
- 0.35-micron CMOS process technology
- Power consumption
  - 3.0 mW (normal mode)
  - 2.7 mW (halt mode)
  - 0.00015 mW (stop mode)
- Packages
  - 28-pin SDIP (400 mil)
  - 30-pin SSOP (300 mil)

Features

- Architecture
  - 8-bit CPU
  - Bit, byte, or word instruction set with 8 x 8 multiply instruction
  - Minimum instruction execution time
    - 400 ns using XTAL
    - 500 ns using RC oscillation
  - Eight 8-bit registers
- Memory
  - 64K linear address space
  - 2K to 16K internal ROM
  - 16K flash version
  - Fully static 256-byte internal RAM
- Clock sources
  - Resonator: 1 to 5 MHz (µPD78910x/911x)
  - RC circuit: 0.4 to 4 MHz (µPD78912x/913x)
- Interrupts
  - Three external maskable interrupts
  - Six internal maskable interrupts
  - Automatic release of halt and stop modes
- Peripherals
  - Twenty general-purpose I/O pins
  - One 16-bit timer/counter
  - One 8-bit timer/event counter with PWM mode
  - One watchdog/interval timer

- One serial channel
  - UART with baud rate generator
  - Three-wire synchronous mode
- Four-channel 8- or 10-bit A/D converter

Table 1. Power-Saving Features

Voltage	Mode and Typical Power at 5 MHz [Note]		
	Normal Mode: Chip 100% On (Main System Clock On)	**Halt Mode: CPU Clock Off and Main Clock On**	**Stop Mode: Main Clock Off**
5 volts	10.5 mW	8 mW	0.0005 mW
3 volts	3 mW	2.7 mW	0.0001 mW

Note: Target specification

Table 2. Ordering Information

Part Number	Internal ROM	A/D	Main Clock Source	RAM
µPD789101CT/GS	2K mask ROM	8-bit	Ceramic resonator	256
µPD789102CT/GS	4K mask ROM	8-bit		
µPD789104CT/GS	8K flash memory	8-bit		
µPD789111CT/GS	2K mask ROM	10-bit		
µPD789112CT/GS	4K mask ROM	10-bit		
µPD789114CT/GS	8K flash memory	10-bit		
µPD78F9116CT/GS	16K flash memory	10-bit		
µPD789121CT/GS	2K mask ROM	8-bit	RC clock	
µPD789122CT/GS	4K mask ROM	8-bit		
µPD789124CT/GS	8K flash memory	8-bit		
µPD789131CT/GS	2K mask ROM	10-bit		
µPD789132CT/GS	4K mask ROM	10-bit		
µPD789134CT/GS	8K flash memory	10-bit		
µPD78F9136CT/GS	16K flash memory	10-bit		

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For literature, call **1-800-366-9782** 7 a.m. to 6 p.m. Pacific time
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