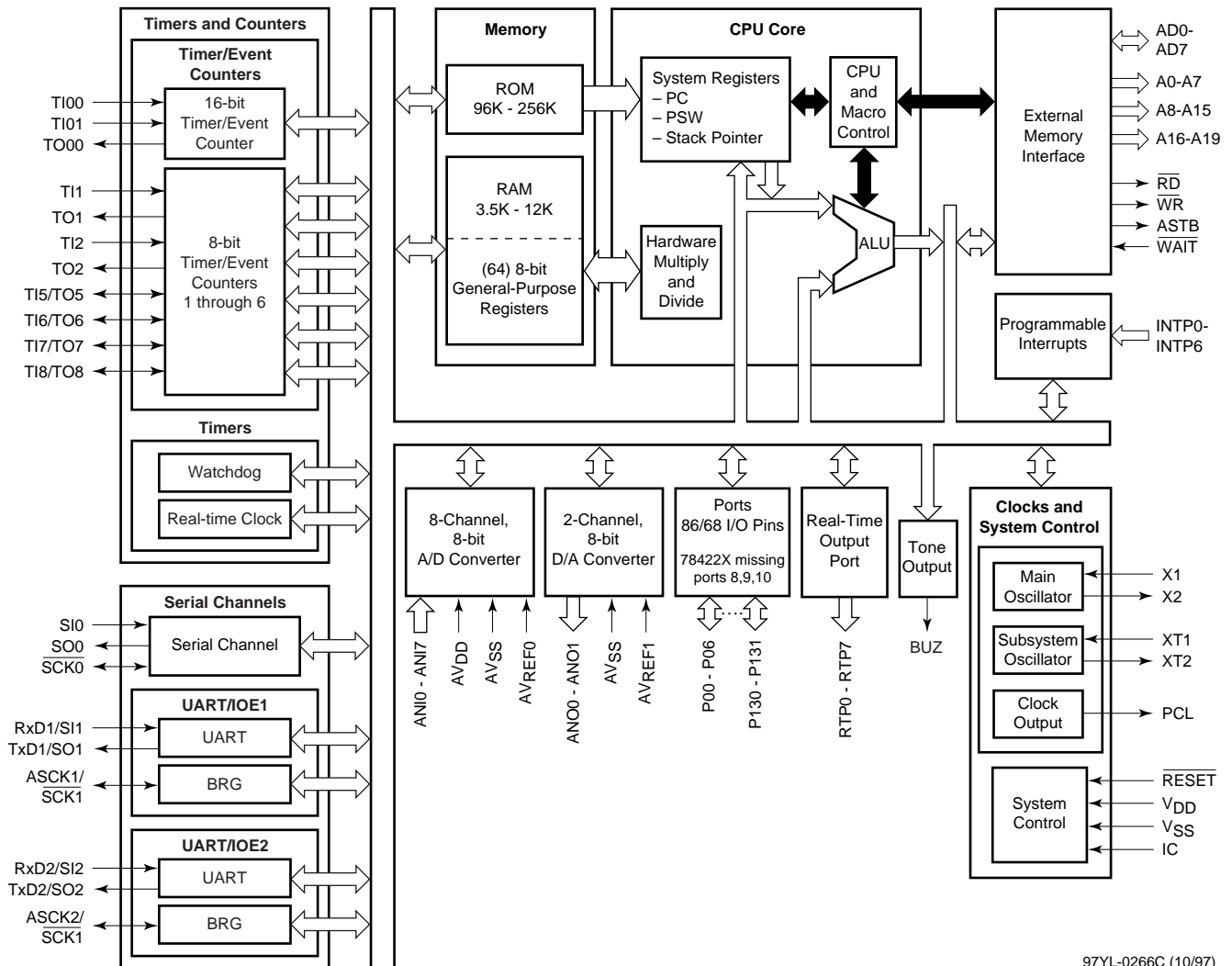


### Description

The μPD7842xx devices are highly integrated members of NEC's K4 family of 16-bit microcontrollers whose expanded memory and higher performance provide an upward migration path for NEC's 8-bit K0 microcontrollers. With the same peripherals and instruction set, and an address space expanded to 1M, the μPD7842xx makes it easy to add features to any existing K0 design. The minimum instruction execution time is reduced from 0.4 μs to 0.16 μs, and RAM/ROM options are increased to allow up to 256K ROM and 12K RAM on chip. Dual oscillators, 1.8- to 5.5-volt operation, and powerful power-saving modes combine to make this family ideal in consumer electronics applications requiring high integration and very low cost.

The μPD7842xx is supported by an extensive tool chain that includes a software simulator, C compiler, relocatable assembler, screen debugger and in-circuit emulator. These tools are compatible throughout NEC's K Series® product line.

### Block Diagram



## Specifications

- Clock frequency: up to 12.5 MHz
- Performance: 160  $\mu$ s minimum instruction execution time
- Operating voltage: 1.8 to 5.5 volts
- Operating temperature:  $-40$  to  $+85^{\circ}\text{C}$
- 0.35-micron CMOS process technology
- Power consumption
  - 24 mW (normal mode)
  - 9 mW (halt mode)
  - 0.0005 mW (stop mode)
- Packages
  - 80-pin QFP (14 x 14 mm or 12 x 12 mm)
  - 100-pin QFP (14 x 20 mm or 14 x 14 mm)

## Features

- Architecture
  - 16-bit CPU
  - Bit, byte, or word instruction set operation
  - 160 ns minimum instruction execution time
  - Eight register banks; eight 8-bit registers per bank
- Memory
  - 1M linear address space
  - 96K to 256K internal ROM
  - 128K or 256K flash version
  - Fully static 3.5K to 12K internal RAM
- Clock sources
  - Up to 12.5 MHz main clock
  - 32 kHz subsystem clock
- Interrupts
  - One internal and one external non-maskable interrupt
  - Eight external maskable interrupts
  - 19 internal maskable interrupts
  - Automatic release of halt and stop modes
- Peripherals
  - 68 and 86 general-purpose I/O pins
  - One 16-bit timer/event counter
  - Up to six 8-bit timer/counters
  - One 0.5-second real-time clock
  - One watchdog/interval timer
  - Three serial channels
    - Two UART/synchronous channels with baud rate generators
    - One synchronous serial channel
  - Eight-channel 8-bit A/D converter: 15  $\mu$ s conversion time

- Two-channel 8-bit D/A converter: 10  $\mu$ s settling time
  - One 8-bit real-time output port
  - Clock and buzzer (tone) output
  - Eight inputs to detect and release halt and stop modes
- External bus interface: up to 1M external address space

**Table 1. Power-Saving Features**

Voltage	Mode and Typical Power at 12.5 MHz			
	Normal Mode: Chip 100% On (Main System Clock On)	Halt Mode: CPU Clock Off and Main Clock On	Stop Mode: Main Clock Off <sup>Note</sup>	
			32 kHz Subsystem Clock On	No 32 kHz Subsystem Clock
5 volts	100 mW	40 mW	0.06 mW	0.05 mW
3 volts	24 mW	9 mW	0.012 mW	0.006 mW

**Note:** Target specification

**Table 2. Ordering Information (Add 'Y' to End of Part Number to Order I<sup>2</sup>C™ Version)**

Part Number	Internal ROM	Internal RAM
$\mu$ PD78214GC/GF	96K mask ROM	3.5K
$\mu$ PD78215GC/GF	128K mask ROM	5K
$\mu$ PD78216GC/GF	128K mask ROM	8K
$\mu$ PD78217GC/GF	192K mask ROM	12K
$\mu$ PD78218GC/GF	256K mask ROM	12K
$\mu$ PD78F4216GC/GF	128K flash memory	8K
$\mu$ PD78F4218GC/GF	256K flash memory	12K
$\mu$ PD784224GC/GK	96K mask ROM	3.5K
$\mu$ PD78225GC/GK	128K mask ROM	4.3K
$\mu$ PD78F4225GC/GK	128K flash memory	4.3K

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