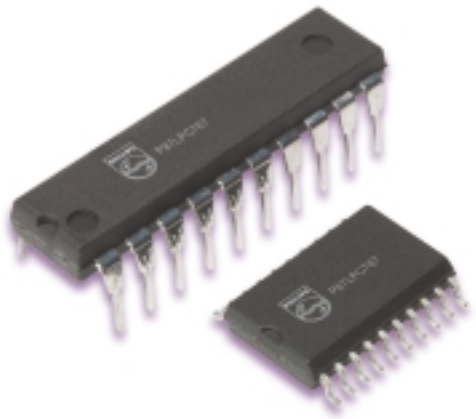
P87LPC767

Low-power, low-system cost 80C51-based microcontroller with analog-to-digital converter (ADC)



Semiconductors

Features

- An accelerated 80C51 CPU provides instruction cycle times of 300–600 ns for all instructions except multiply and divide when executing at 20 MHz. Execution at up to 20 MHz when V_{DD} = 4.5 V to 6.0 V, 10 MHz when V_{DD} = 2.7 V to 6.0 V
- Four-channel multiplexed 8-bit A/D converter. Conversion time of 9.3 microseconds at f_{osc} = 20 MHz
- 2.7 V to 6.0 V operating range for digital functions
- 4 K bytes EPROM code memory
- 128 byte RAM data memory
- 32 byte customer code EPROM allows serialization of devices, storage of setup parameters, etc.
- Two 16-bit counter/timers. Each timer may be configured to toggle a port output upon timer overflow
- Two analog comparators
- Full duplex UART
- I^2C communication port

Benefits

- 4-channel, 8-bit Analog to Digital Converter
  — 9.3 microseconds conversion time at 20 MHz
- 20 MHz max operating frequency 4.5 – 6.0 V and 10 MHz max operating frequency 2.7 – 6.0 V
  — 100% accelerated C51 CPU core runs at 6 clocks per instruction
- Configurable brownout reset detector
- On-chip serial communications interfaces
  — UART
  — I^2C

Ordering information

Part Number	Temperature (degrees C)	Package Description
P87LPC767BN	0 to +70	DIP20
P87LPC767BD	0 to +70	SO20
P87LPC767FD	–40 to +85	SO20

Description

The 87LPC767 is a highly integrated single-chip microcon-troller designed for low system cost applications. As a member of the 51LPC microcontroller family, the 87LPC767 offers an 8-bit ADC with four multiplexed channels and two analog comparators with dual multiplexed inputs and on-chip reference. In addition, the device provides 4K of OTP code memory and 128 bytes of data SRAM, making it suitable for high-level programming. The code memory is in-system programmable (ISP) through a serial interface. Other embedded features which reduce the need for external components, are brownout detection and an on-chip RC oscillator that is very stable over temperature and voltage.

The MCU core is fully compatible with the industry-standard C51 core, but features a 2X speed mode, where the CPU clock is divided by 6 instead of 12. At 20 MHz, the 51LPC family devices provide a throughput identical to that of a conventional C51 running at 40 MHz, thus minimizing EMI and power consumption. The 87LPC767 is manufactured using Philips Semiconductors' low-power CMOS technology and is well suited for use in battery powered applications. At 32 kHz, the device consumes only 16 uA and the operating voltage ranges from 2.7 – 6.0 V (3.0 – 6.0 V for analog peripherals). A fixed-frequency oscillator running at 6 MHz can be used to clock the device in applications that do not require the high accuracy of a crystal. Regardless of the clock source selected, the user may decrease the operating frequency down to as little as 1/512 of the source frequency, allowing the user to optimize performance and power consumption on-the-fly. Use of the on-chip power-on reset and oscillator makes up to 18 I/O pins available to the user, leaving only two non-I/O pins for connection to power and ground.

The device comes with extensive serial communication capabilities. The on-chip UART provides RS-232 and RS-485 serial communications. The I^2C interface provides an interface to other I^2C units such as serial EEPROMs, other MCUs and a variety of other peripheral devices. These communications interfaced in combination with the analog capabilities of the chip make the 87LPC767 ideal for a variety of applications which include sensors.

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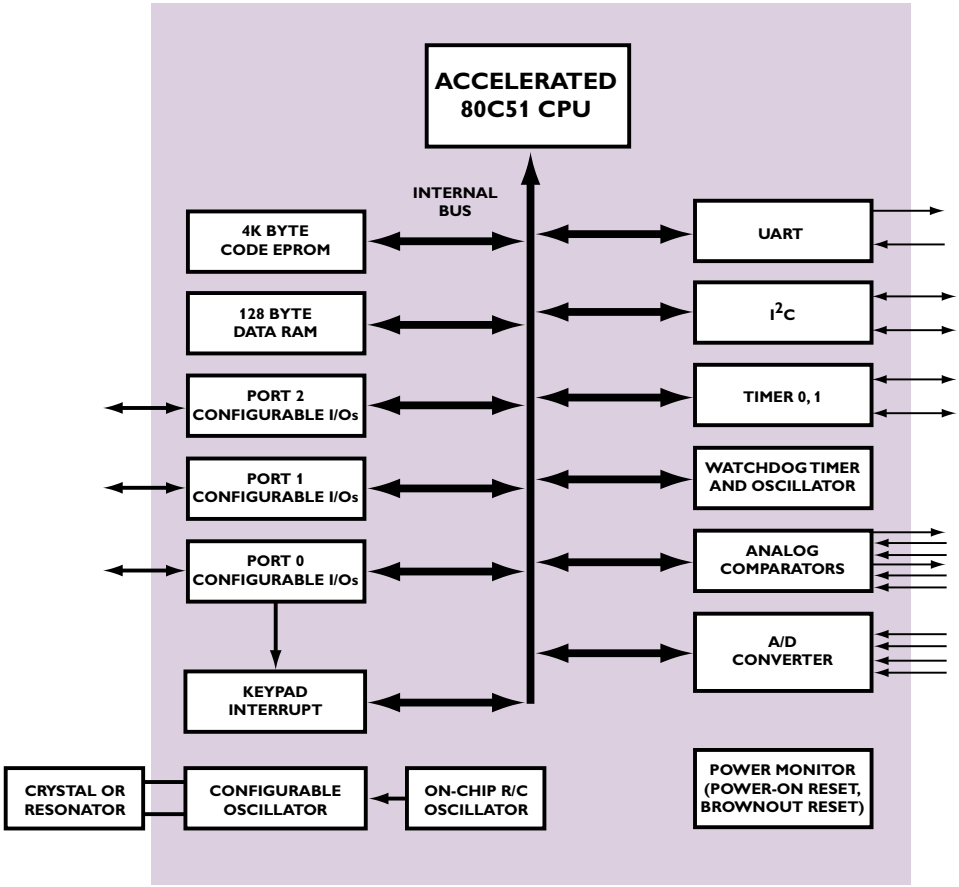
P87LPC767 block diagram



Purchase of Philips I²C components conveys a license under the Philips' patent to use the components in the I²C system provided the system conforms to the I²C specification defined by Philips.

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Date of release: February 2003
document order number: 9397 750 11107

Published in U.S.A.