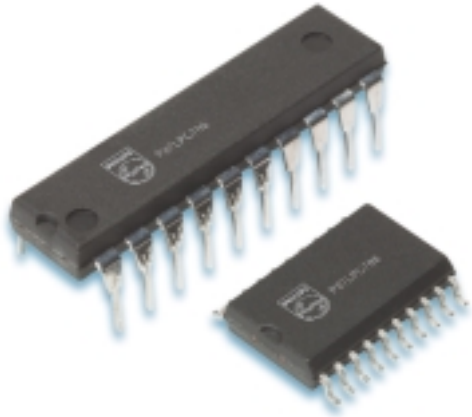


P87LPC768

Low power, low system cost 80C51 MCU with ADC and PWM



Description

As a member of the 51LPC microcontroller family, the 87LPC768 offers an 8-bit ADC with four multiplexed channels and an 8-bit Pulse Width Modulator (PWM.) Further, 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 that reduce the need for external components are brownout detection, power-on reset 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 a conventional C51 running at 40 MHz, thus minimizing EMI and power consumption. The 87LPC768 is manufactured in Philips Semiconductor's low-power CMOS technology and is well suited for use in battery powered applications. At 32 kHz, the device consumes only 16 μ A and the operating voltage ranges from 2.7 – 6.0V (3.0 – 6.0V 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 used, the user can reduce operating frequency down to as much 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.

Because the P87LPC768 combines an embedded ADC and PWM, it is especially useful in applications that include dynamic positioning, speed and temperature control. The PWM provides very high flexibility since the output resolution can be configured to any number of bits up to 10.

The device comes with extensive serial communication capabilities. On-chip UART provides serial communications for RS-232 and RS-485. The I²C interface provides interface to other I²C units such as serial EEPROMs, other MCUs and a variety of peripheral devices. These communications interfaced in combination with the analog capabilities makes the 87LPC768 ideal for a variety of sensor applications.

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 6.0V, 10 MHz when $V_{DD} = 2.7$ V to 6.0V
- Four-channel Pulse Width Modulator
- Four-channel multiplexed 8-bit A/D converter. Conversion time of 9.3 microseconds at $f_{osc} = 20$ MHz
- 2.7V to 6.0V operating range for digital functions
- 4 K bytes OTP 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
- I²C communication port

Ordering information

Part Number	Temperature (C)	Package Description	Operating Frequency
P87LPC768BN	0 to +70	DIP20	All devices operate at
P87LPC768BD	0 to +70	SO20	20 MHz @ 4.5 to 6.0V
P87LPC768FN	-40 to +85	DIP20	10 MHz @ 2.7 to 6.0V
P87LPC768FD	-40 to +85	SO20	

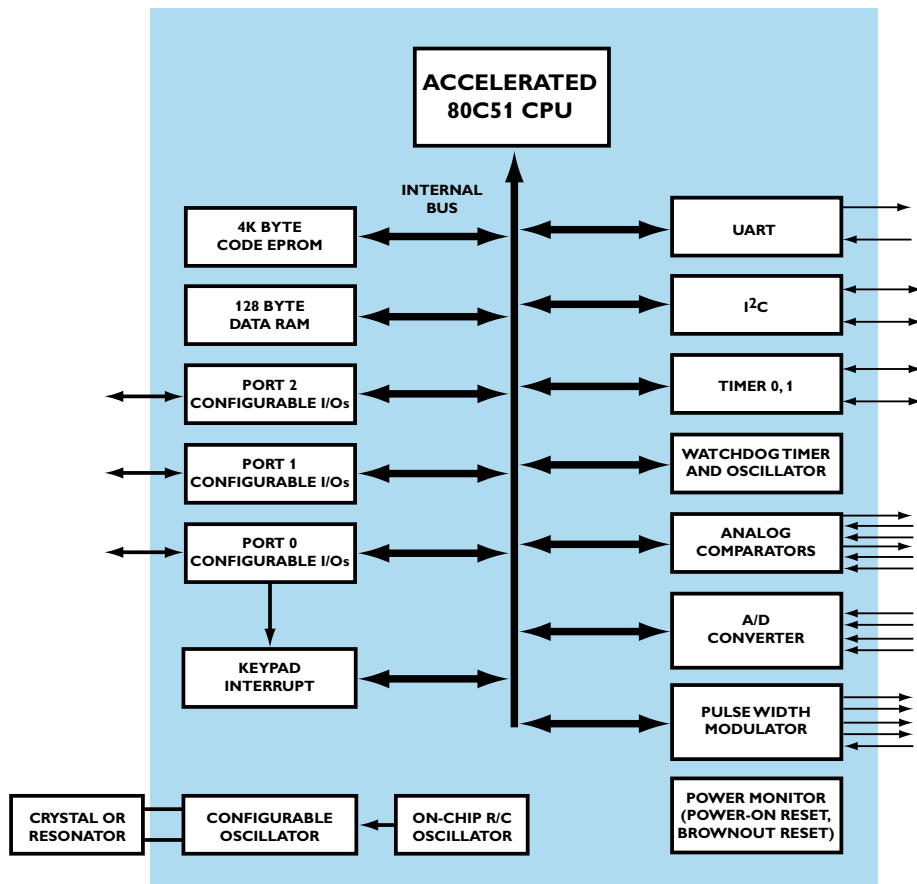


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P87LPC768 block diagram



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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