SAMSUNG ELECTRONICS

KS57C0301/0302
4-Bit CMOS Microcontroller

Data Sheet

DESCRIPTION

The KS57C0301/0302 single-chip 4-bit microcontroller is fabricated using an advanced CMOS process. With comparator inputs, high-current LED direct drive pins, serial I/O interface, and a versatile 8-bit timer/counter, the KS57C0301/0302 offers an excellent design solution for a wide range of applications such as mouse controllers, subsystem controllers, and toys.

FEATURES

Memory

- 1024 × 8-bit ROM (KS57C0301)
- 2048 × 8-bit ROM (KS57C0302)
- 128 × 4-bit RAM (KS57C0301)
- 256 × 4-bit RAM (KS57C0302)

I/O Pins

- Up to 15 pins for 20-DIP and 20-SOP package

Comparator Inputs

- 4-channel mode
  Internal reference: 4-bit resolution
- 3-channel mode
  External reference

8-Bit Basic Timer

- Programmable interval timer

8-Bit Timer/Counter

- Programmable interval timer
- External event counter function
- Timer clock output to TIO pin

Watch Timer

- Time interval generation: 0.5 s, 3.9 ms at 4.19 MHz
- Four frequency outputs to BUZ pin

Bit Sequential Carrier

- 16-bit serial data transfer in arbitrary format

Frequency Outputs

- Eight frequency outputs to the CLO pin

8-Bit Serial I/O Interface

- 8-bit transmit/receive mode
- 8-bit receive-only mode
- LSB-first or MSB-first transmission selectable
- Internal or external clock source

Interrupts

- One external interrupt vector
- Three internal interrupt vectors
- Two quasi-interrupts

Memory-Mapped I/O Structure

Two Power-Down Modes

- Idle mode: Only the CPU clock stops
- Stop mode: Main system clock stops

Oscillation Sources

- Crystal/ceramic: 4.19 MHz (typical)
- RC: 1 MHz (typical)
- CPU clock divider circuit (by 4, 8, or 64)

Instruction Execution Times

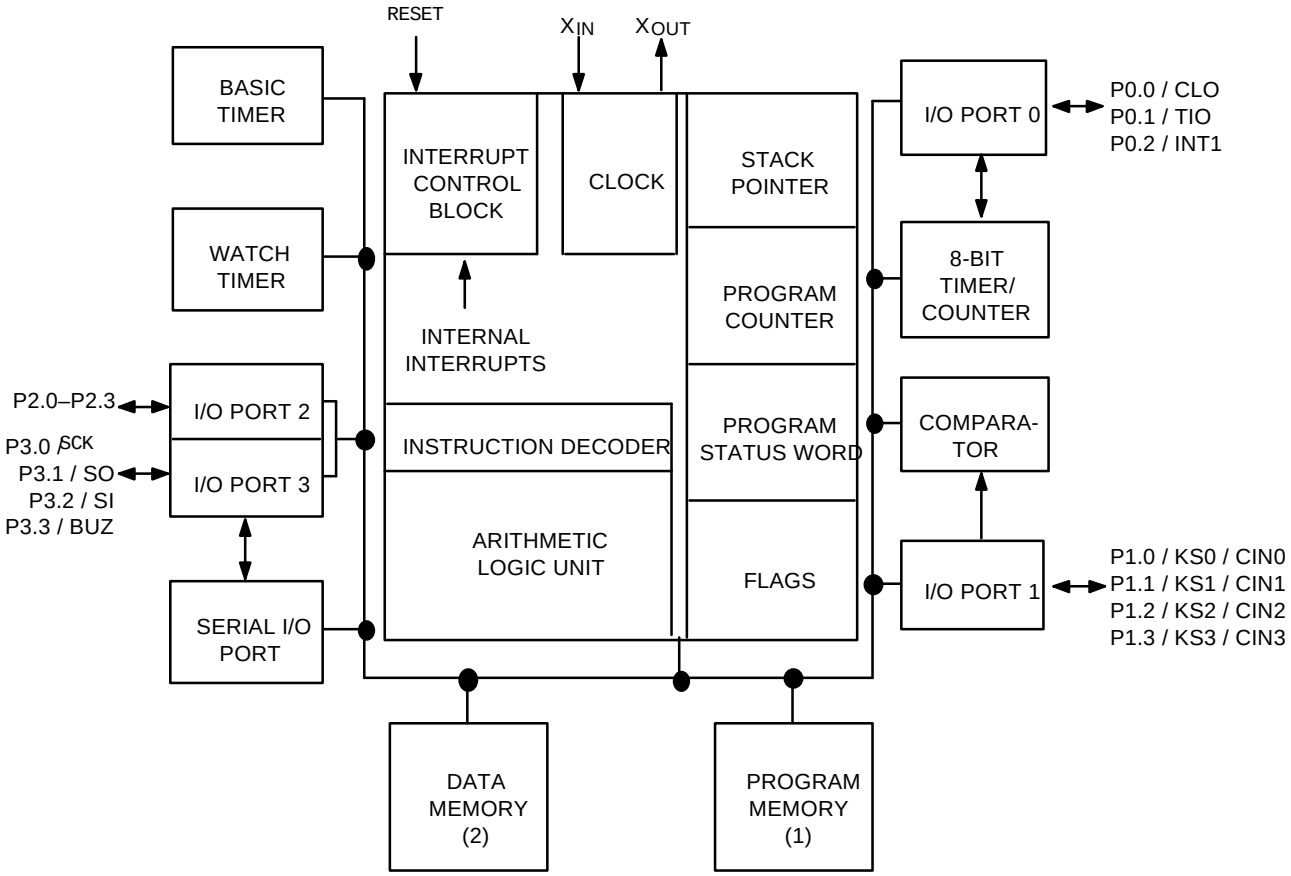
- 0.95, 1.91, 15.3 µs at 4.19 MHz (5 V),
  4 µs at 1 MHz (2.7 V)

Operating Temperature: – 40°C to 85°C

Operating Voltage Range: 2.7 V to 6.0 V

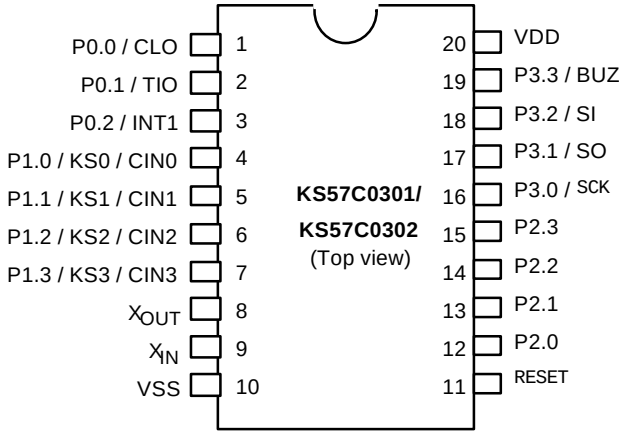
Package Type: 20-DIP, 20-SOP

BLOCK DIAGRAM



NOTE: (1) Program Memory is 1-KByte (KS57C0301) and 2-KByte (KS57C0302).
(2) Data Memory is 128 x 4 bit. (KS57C0301) and 256 x 4 bit (KS57C0302).

PIN ASSIGNMENTS



NOTE Pin assignments are identical for the 20-pin DIP and SOP package.