GSET - Programming with Mr. Hill

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Module 7 - Microcontollers

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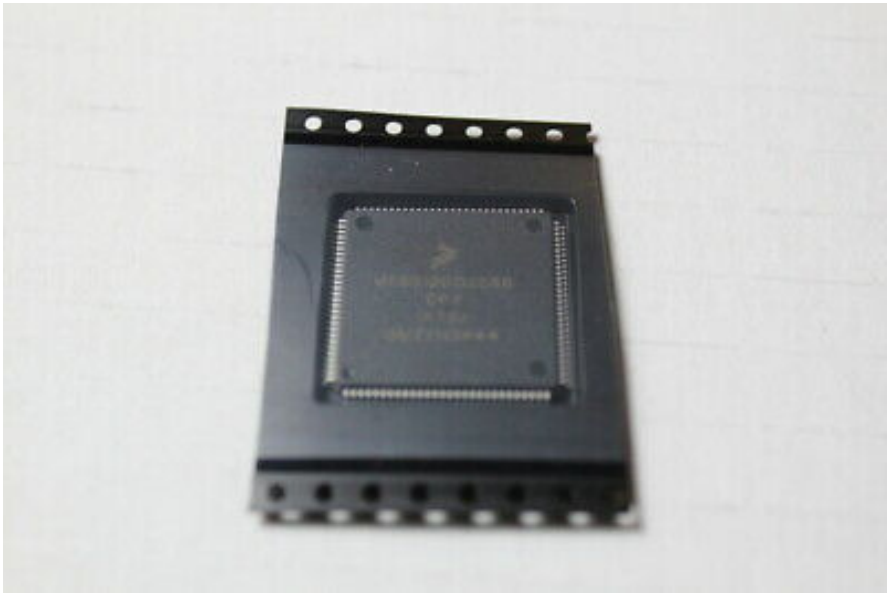
- What is a microcontroller?
- MCU applications
- System on Chip
- Capabilities and Resources
- Programming for Microcontrollers



What is a microcontroller?

A microcontroller (MCU for microcontroller unit) is a small computer on a single metal-oxide-semiconductor (MOS) integrated circuit (IC) chip. A microcontroller contains one or more CPUs (processor cores) along with memory and programmable input/output peripherals.

- System on Chip
- Examples:
  - Motorolla HCS12
  - Pic
  - Atmel Atmega 2560
  - Atmel Atmega 328p
  - STM32 Arm Cortex M0
  - STM32 Arm Cortex M4

MCU applications

Microcontrollers are used in embedded system design in many different systems...

- Automotive
- Aerospace
- Personal Devices
- Appliances
- and many more ...

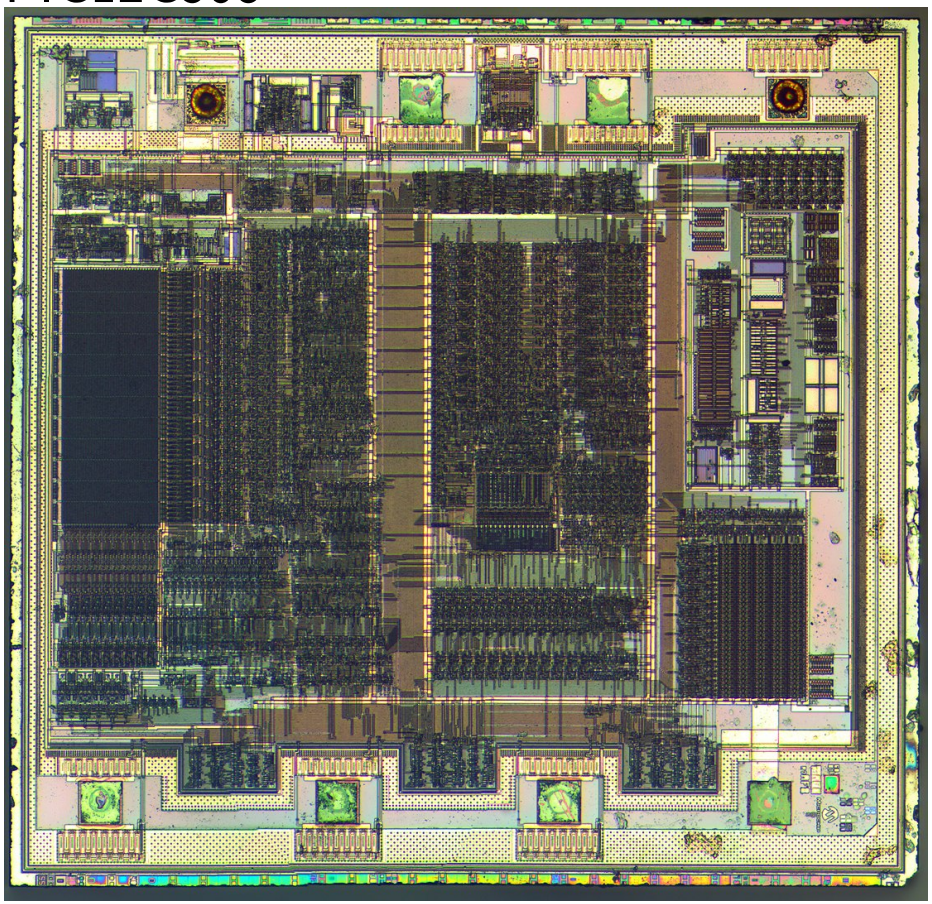
System on Chip

A microntoller is a system on a chip.

A system on a chip (SoC...) is an integrated circuit (also known as a "chip") that integrates all or most components of a computer or other electronic system. These components almost always include a central processing unit (CPU), memory, input/output ports and secondary storage, often alongside other components such as radio modems and a graphics processing unit (GPU) all on a single substrate or microchip.

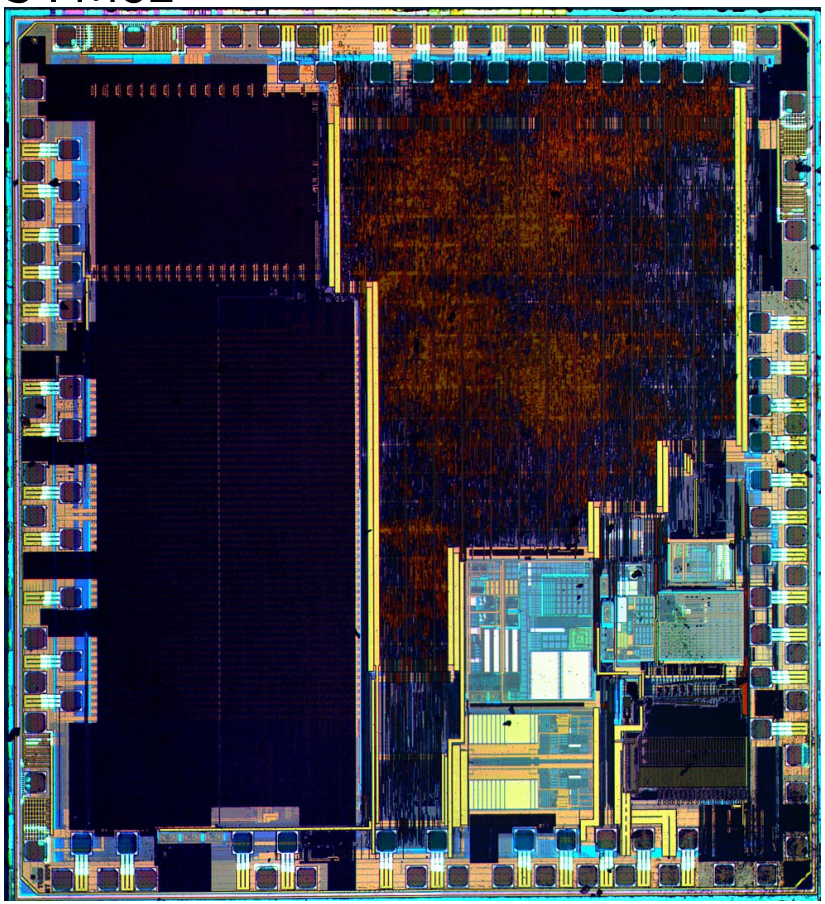
System on Chip

PIC12C508



System on Chip

STM32



Capabilities and Resources

What does a MCU do that a desktop or notebook computer does not?

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What does a desktop or notebook computer do that an MCU does not?

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Capabilities and Resources

- CPU
- RAM
- ROM
- Oscillator
- GPIO
- Peripherals

Example Datasheets: atmel328p arm-cortex-m0

ref:

Programming for Microcontrollers

When programming a microcontroller, you use a cross compiler built into the programming environment.