

AVR Family Overview

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AVR Family Overview

- AVR can be classified into three main groups:
 - Classic AVR
 - This is the original AVR chip, which has been replaced by newer AVR chips.
 - Tiny
 - As its name indicates, the microcontrollers in this group have less instructions and smaller packages in comparison to mega family. You can design systems with low costs and power consumptions using the Tiny AVR.
 - Program memory: 1K to 8K bytes
 - Package: 8 to 28 pins
 - Limited peripheral set
 - Limited instruction set: The instruction sets are limited. For example, some of them do not have the multiply instruction.
 - Mega
 - Program memory: 4K to 256K bytes
 - Package: 28 to 100 pins
 - Extensive peripheral set
 - Extended instruction set: They have rich instruction sets

AVR features

- The AVR is an 8-bit RISC single-chip microcontroller with Harvard architecture that comes with some standard features such as on-chip program (code) ROM, data RAM, timers and I/O ports.

AVR microcontroller program ROM

- ROM is used to store programs and for that reason it is called *program* or *code ROM*.
- The program ROM size can vary from 1K to 256K depending on the family member.

AVR microcontroller data RAM and EEPROM

- While ROM is used to store program (code); the RAM space is for data storage.
- The AVR has a maximum of 64K bytes of data RAM space.
- The data RAM space has three components:
 - General-purpose registers
 - I/O memory
 - Internal SRAM
 - There are 32 general-purpose registers in all of the AVRs, but the SRAM's size and the I/O memory's size varies from chip to chip.

AVR microcontroller I/O pins

- The AVR can have from 3 to 86 pins for I/O.
- The number of I/O pins depends on the number of pins in the package itself. The number of pins for the AVR package goes from 8 to 100 at this time. In the case of the 8-pin AT90S2323, we have 3 pins for I/O, while in the case of the 100-pin ATmega1280, we can use up to 86 pins for I/O.