The ATmega2560 Microcontroller

Or: There and Back Again

Group 8
What/Where is it?
# Specs

<table>
<thead>
<tr>
<th>Flash</th>
<th>EEPROM</th>
<th>RAM</th>
<th>General purpose I/O pins</th>
<th>16 Bit PWM Channels</th>
<th>Serial USARTS</th>
<th>ADC Channels</th>
</tr>
</thead>
<tbody>
<tr>
<td>256KB</td>
<td>4KB</td>
<td>8KB</td>
<td>86</td>
<td>12</td>
<td>4</td>
<td>16</td>
</tr>
</tbody>
</table>

write/erase cycles: EEPROM 100,000/ flash 10,000

Speed grade: 0 - 16MHz @ 4.5V - 5.5V

Data retention: 20 years at 85°C/ 100 years at 25°C

Digikey Price: ~$18 (for 1 unit)
Comparison

The ATmega2560 is on the higher end of chips used in Arduinos, illustrated by comparison with the most popular Arduino, the Arduino Uno, which uses the ATmega328P.

<table>
<thead>
<tr>
<th></th>
<th>ATmega328P</th>
<th>ATmega2560</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash Memory</td>
<td>32 KB</td>
<td>256 KB</td>
</tr>
<tr>
<td>EEPROM</td>
<td>1 KB</td>
<td>4 KB</td>
</tr>
<tr>
<td>Programmable I/O Lines</td>
<td>23</td>
<td>86</td>
</tr>
<tr>
<td>Internal SRAM</td>
<td>2 KB</td>
<td>8 KB</td>
</tr>
<tr>
<td>Speed</td>
<td>16 MIPS at 16MHz</td>
<td>16 MIPS at 16MHz</td>
</tr>
</tbody>
</table>
Features

- High Performance, Low Power Atmel® AVR® 8-Bit Microcontroller
- Advanced RISC Architecture
- High Endurance Non-volatile Memory Segments
- Atmel® QTouch® library support
- JTAG (IEEE® std. 1149.1 compliant) Interface
RISC Architecture

135 Powerful Instructions – Most Single Clock Cycle Execution

32 × 8 General Purpose Working Registers

Fully Static Operation

Up to 16 MIPS Throughput at 16MHz

On-Chip 2-cycle Multiplier
Atmel® QTouch® library support

- Capacitive touch buttons, sliders and wheels
- QTouch and QMatrix acquisition
- Up to 64 sense channels
JTAG (IEEE® std. 1149.1 compliant) Interface

– Boundary-scan Capabilities According to the JTAG Standard
– Extensive On-chip Debug Support
– Programming of Flash, EEPROM, Fuses, and Lock Bits through the JTAG Interface
Supporting Hardware and Shrinking Arduino Projects
Minimal Hardware Requirements

- 16 MHz crystal resonator
- Some capacitors
- Some resistors
- LEDs (if you want to be fancy)

- CP2102 USB to UART TTL Module
- Another arduino (for programming the bootloader)
Smaller/Specific Hardware
Sources:


