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What Is an SoC? A Basic Definition

By Scharon Harding published September 11, 2019

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(Image credit: Henriok/Wikimedia Commons)

SoC stands for system on a chip. This is a chip/integrated circuit that holds many com[...] (via a microprocessor or microcontroller), memory, input/output (I/O) ports and sec[...] as silicon. Having all of these components on one substrate means SoCs use less p[...]i- chip counterparts. SoCs are becoming increasingly popular with the growth of Inte[...] computing. Take, for example, Intel's September 2018 acquisition of SoC firm Silico[...] of Altera and others.

One common example of tech that uses an SoC is video game consoles, such as the[...]ch or the AMD Flute and AMD Gonzalo SoCs expected to power the next Xbox and Pla[...]rs, Arduino boards and STEM kits also use SoCs. SoCs are often used in STEM kits beca[...] helpful in teaching STEM. You also find SoCs in smartphones and tablets.

SoC on a Raspberry Pi 3 (Image credit: Florian Knodt/Wikimedia Commons)

Broadly speaking, there are three different types of SoCs:

- SoCs that use a microcontroller (a chip with the CPU, RAM, ROM and potentially other components). Example: Arduino boards
- SoCs that use a microprocessor (a chip with a CPU only). Examples: SoCs for smartphones, like Qualcomm's Snapdragon 845 (also used for virtual reality headsets) and the Apple A12 Bionic SoC used in the iPhone XS, iPhone XS Max and iPhone XR. Rasperry Pi and Intel's line of SoC **FPGAs**.
- SoCs for specific applications, which may or may not use a microprocessor or microcontroller. This is known as an ASIC (application-specific integrated circuit).

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