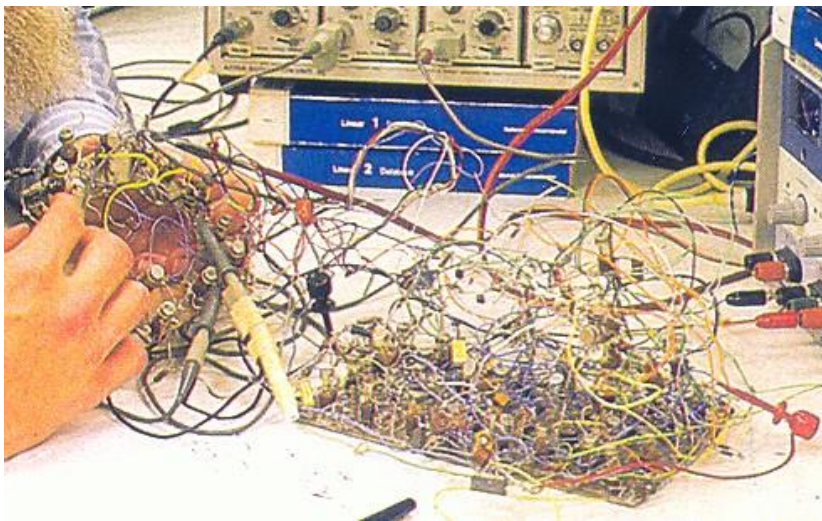


4_1 Evaluation Boards, Single Board Computers, SOC

Contents

1. Evaluation Boards -	1
What is a Single Board Computer (SBC)?	4
Pros and Cons of Using a SBC.....	4
System-on-Chip vs Single-Board Computer: A Comparison Guide.....	5
What is a System on Chip (SoC)?	5
Pros and Cons of Using a SoC.....	5



Hope this isn't you!

1. Evaluation Boards -

You first select the processor you think you are going to need, then you check if there is an evaluation board available for it. You normally select the processor on the basis of what I/O functionality you need and what CPU power and memory amount you think you need. –

An evaluation/development board is just a convenient method of creating a breadboard of a system without a lot of custom hardware design. You need to start with your requirements, two of the most important are I/O and processing capability. Analog inputs? Sampling rate? Keyboard? Push-buttons? Built-in LCD display? HDMI port to an external monitor? etc. Then you can start narrowing it down. There are hundreds of options. – [Mattman944 Dec 4 '19 at 3:32](#)

<https://electronics.stackexchange.com/questions/470215/what-is-an-evaluation-board-used-for>

Generally, these are purchased from the manufacture of a specific chip such as the PIC 24F chip. Here are a few older examples:



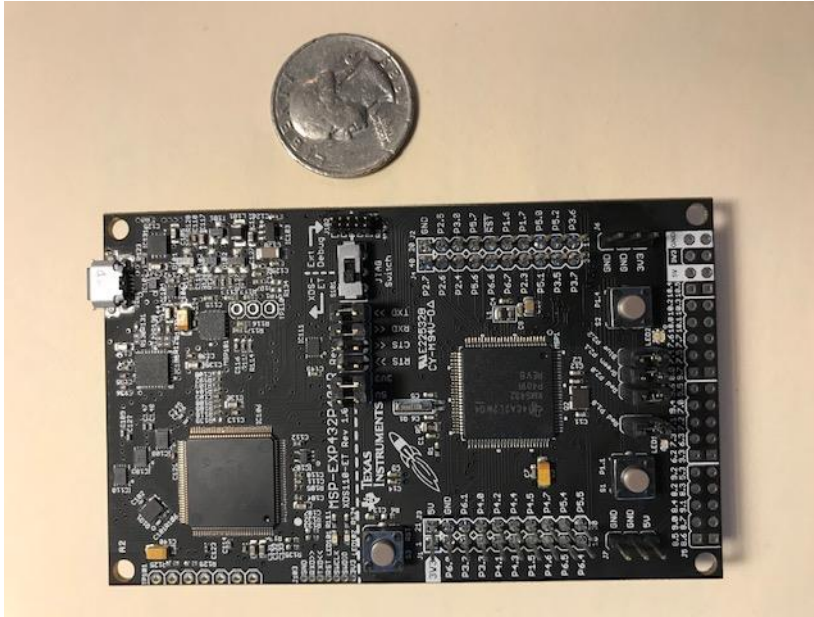
68000

Such boards are used to evaluate a CPU or a custom design using that CPU as the controller in a final product. The connectors at the end are used to connect to custom circuits that the designer needs for the product.



68332





TI 432

These are a few examples.

What is a Single Board Computer (SBC)?

A single board computer is a complete system/computer built on a single printed circuit board. They are simple and easy to design in. All you have to do is add your secret sauce on the board or integrate it in a bigger system to make it yours. SBCs are a great fit for customers who need to get their product to market quickly. There are wide range of boards available today, ranging from the traditional ATX/BTX (Advanced Technology Extended/Balanced Technology Extended) to COM (Computer on Module) which measures 58mmx65mm. SBC manufacturers often offer customization for very little or no non-recurring engineering costs. Here are some of the pros and cons of using a SBC.

Pros and Cons of Using a SBC

Why use a SBC in your design?

- Easy to use – skip the hundreds of pages of design rule checking (DRC) documents and layout guidelines of the SoCs
- Proven hardware – Making one simple mistake in a SoC board design can be very expensive. Boards reduce this risk
- Customizable – Ability to customize a board means you are paying for exactly what you need
- Single source – BOM of a simple SoC board can still be in the 100s. SBC makes it easy for logistics
- Time to Market – Much faster design cycle than for a SoC

Why not use a SBC?

- Cost – If your product is in the high volume category, then it may make more sense to do your own design and justify the engineering costs
- Flexibility – If you need a lot of customization on a given SBC, it will be worthwhile to consider doing a SoC design
- Knowledge – If you plan to use the same/similar SoC for multiple products, then investing the time and effort to develop deep understanding of the product is worth it

System-on-Chip vs Single-Board Computer: A Comparison Guide

<https://www.semiconductorstore.com/blog/2015/System-on-Chip-vs-Single-Board-Computer-A-Comparison-Guide/689>

What is a System on Chip (SoC)?

As the name suggests, a SoC integrates a lot of system components into a single silicon chip. Along with an application processor, a SoC typically contains memory, power management circuits, and a range of peripherals such as SPI, UART, I2C, USB, SATA, PCI, and PCIe, etc. Additionally, depending on the focus and expertise of the vendor, there is often a core dedicated for special functions. For example, [Fujitsu](#) offers ARM-based SoCs with 2D/3D graphic display controller cores, [GainSpan](#) offers Wifi SoCs, and [AMD](#) offers the world's first X86-based SoC.

Pros and Cons of Using a SoC

The goal of using a SoC in a design is to be able to build a complete system with a single chip and minimal external components. So why wouldn't everyone use one? Let's look at both sides of the coin.

Why use a SoC in your design?

- Size – You get a LOT of functions and features in a small package
- Flexibility – In terms of board size, form factor, and power, it's hard to beat the flexibility that a SoC allows in a design
- Cost efficient – This is especially true for application-specific SoCs such as video codecs, since the alternative is to implement it in software, which can be costly in terms of time and effort
- High volume – SoCs are great if you have a high volume product since it makes it easier to justify the engineering resources and cost

Why not use a SoC?

- Time to market – Design cycles are typically between 6-12 months for a SoC

- Resource limitations – If you are limited in resources or if you don't have too much expertise in the field, a SoC is probably not a good fit
- Lower volume – If you are designing a low volume/high margin type of product, there may be alternatives (see below) that are more suitable, unless you need a highly specialized hardware. You may be better off leveraging hardware from someone else and utilizing your time and resources for application software