

## **Introduction:**

A motherboard, often referred to as the "backbone" of a computer, is a crucial component that connects all the hardware components together. It's responsible for facilitating communication between the CPU, memory, storage devices, and peripherals. Over the years, various form factors of motherboards have emerged, each with its own set of characteristics and use cases. In this study, we'll delve into the key differences between these form factors and their suitability for different types of builds.

## **Discussion:**

The form factor of a motherboard dictates its size, layout, and compatibility with other components. Here are some of the most common form factors:

### **1. ATX (Advanced Technology Extended):**

- Size: Standard size, suitable for most desktop PCs.
- Features: Ample expansion slots, robust power delivery, and support for high-end components.
- Use Cases: Gaming PCs, workstations, and high-performance systems.

### **2. Micro-ATX (mATX):**

- Size: Smaller than ATX, ideal for mid-tower and compact cases.
- Features: Fewer expansion slots compared to ATX, but still sufficient for most users.
- Use Cases: Home PCs, budget gaming systems, and HTPCs.

### **3. Mini-ITX:**

- Size: Extremely compact, perfect for small form factor (SFF) builds.
- Features: Limited expansion options, but suitable for basic computing tasks and low-power systems.

- Use Cases: HTPCs, silent PCs, and mobile workstations.

#### 4. Extended ATX (EATX):

- Size: Larger than ATX, designed for high-end servers and workstations.
- Features: More expansion slots, better cooling options, and support for multiple CPUs.
- Use Cases: High-performance computing, server systems, and overclocking enthusiasts.

#### 5. BTX (Balanced Technology Extended):

- Size: Similar to ATX but with a different layout.
- Features: Improved airflow and thermal performance.
- Use Cases: Less common, but still used in some specialized systems.

#### 6. LPX (Low Profile Extended):

- Size: Similar to ATX but with a lower profile.
- Features: Reduced height for slim cases.
- Use Cases: Specialized systems where height is a constraint.

Form Factor	Build Size	CPU Slots	Memory Slots	Chipsets	BIOS	PCI Slots	SATA	Built-in Features
ATX	Standard	1-2	4-8	Variety	UEFI	Multiple	4-8+	Integrated I/O, audio, networking
Micro-ATX	Mid-tower	1-2	2-4	Variety	UEFI	Fewer than ATX	2-6	Integrated I/O, audio, networking
Mini-ITX	Small form factor	1	2	Limited options	UEFI	1-2	2-4	Integrated I/O, audio, networking

Extended ATX	Full-tower	2+	8+	High-end	UEFI	Multiple	6+	Multiple integrated features
BTX	Standard	1-2	4-8	Variety	UEFI	Multiple	4-8+	Improved airflow
LPX	Low profile	1-2	4-8	Variety	UEFI	Multiple	4-8+	Reduced height