



CIS 1102N

COMPARATIVE STUDY ON DIFFERENT TYPES OF MOTHERBOARDS

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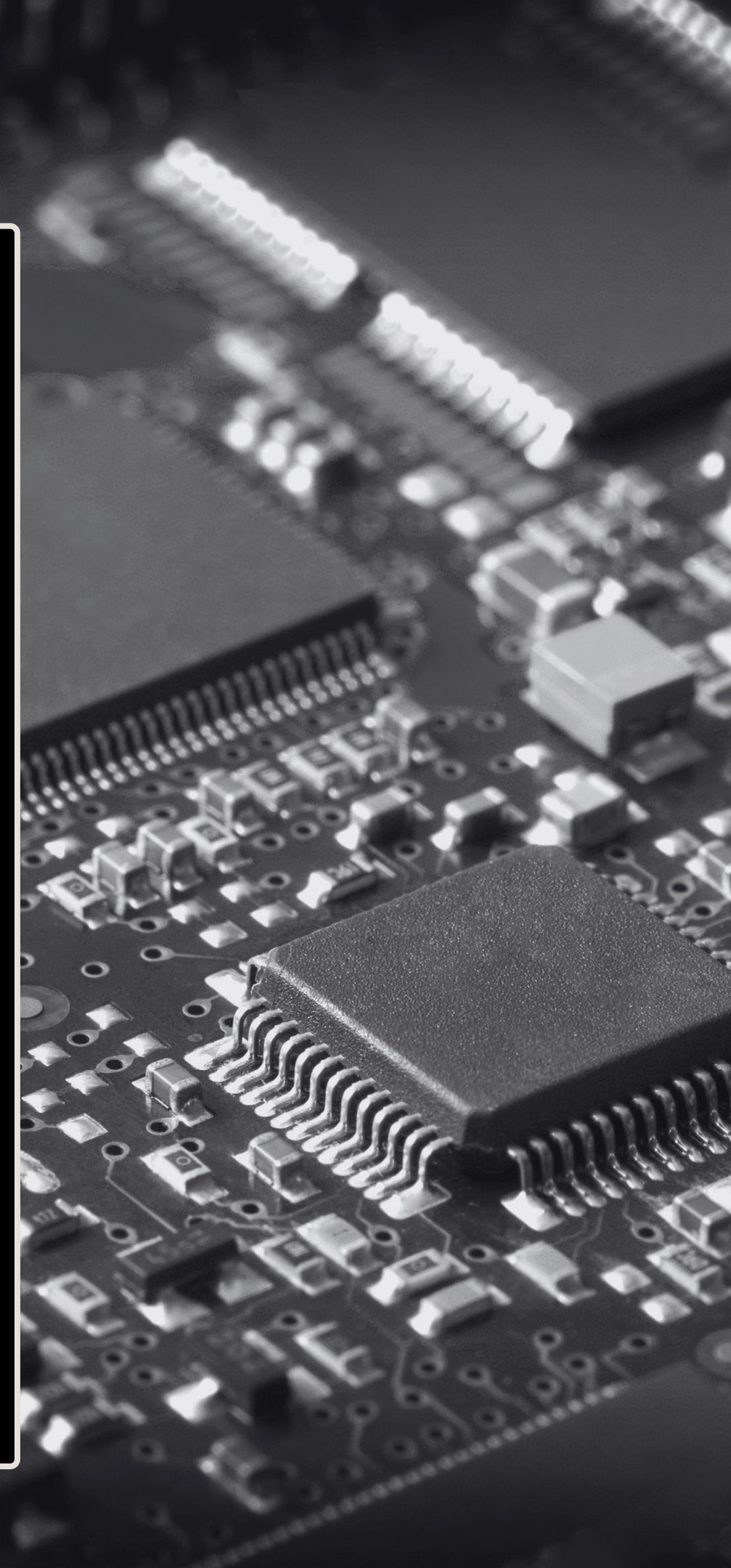




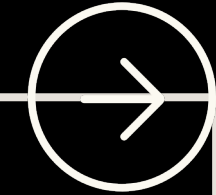
INTRODUCTION

The motherboard serves as the backbone of a computer, connecting all the components and enabling them to communicate. It determines the expandability, performance, and overall capability of a system. Over the years, various motherboard form factors have been introduced to meet the growing demands of different applications, from personal computers to high-performance workstations and compact devices. Each form factor has its own advantages and limitations, offering unique configurations of CPU slots, memory support, and expansion options.

As technology continues to evolve, motherboards have become more versatile, catering to specialized requirements such as smaller form factors for compact systems or advanced configurations for gaming and servers. Understanding the differences between common motherboard types such as AT, ATX, Micro-ATX, Mini-ITX, and others is essential when selecting the right one for a specific use case. This study will compare these motherboard types based on their build, CPU and memory slots, chipset support, BIOS configurations, and other important features.



DISCUSSION



Motherboards differ in their size, expandability, and capabilities. Understanding these distinctions helps in selecting the appropriate type for different applications, such as personal use, gaming, or industrial purposes.

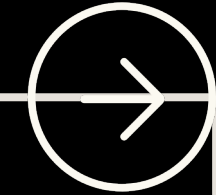
1 AT Motherboard

The AT (Advanced Technology) motherboard, popular in the 1980s, has a large form factor that limits modern compatibility and does not support current CPUs or memory. Its design introduced the standard of slots for peripherals but is now obsolete due to limited expandability and outdated technology.

2 ATX Motherboard

ATX (Advanced Technology eXtended) motherboards are a modern standard, offering flexibility and ample expansion slots. ATX boards have four memory slots and support a variety of CPUs, making them versatile for gaming, productivity, and general-purpose computing.

DISCUSSION



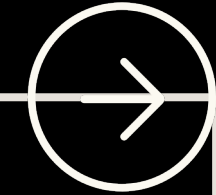
3 BTX Motherboard

BTX (Balanced Technology eXtended) was designed to improve airflow and cooling for powerful components, especially CPUs. While similar in size to ATX, BTX motherboards have a different layout that doesn't align with ATX cases, limiting their adoption.

4 Extended-ATX (E-ATX) Motherboard

E-ATX motherboards are larger than ATX, designed for high-performance workstations or gaming systems. They offer extensive PCIe slots, multiple CPU support, and up to eight memory slots, making them suitable for compute-intensive tasks.

DISCUSSION



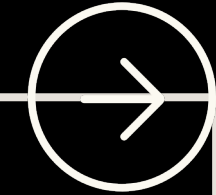
5 LPX Motherboard

LPX (Low Profile eXtended) boards are compact and designed for low-profile cases. Although efficient in space utilization, they lack expansion options, making them suitable for simple, compact builds but less adaptable for upgrades.

6 Micro-ATX Motherboard

Micro-ATX boards are smaller versions of ATX, maintaining compatibility with most features but with fewer PCI slots due to limited space. This board is ideal for budget or mid-tier builds, offering a balance between expandability and space.

DISCUSSION



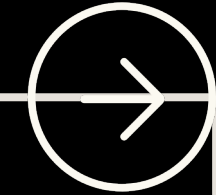
7 Mini-ITX Motherboard

Mini-ITX motherboards are compact and energy-efficient, ideal for small form factor (SFF) systems. They usually feature only two RAM slots and limited PCIe expansion but are popular for compact builds and applications where space and power efficiency are priorities.

8 Mini-ATX Motherboard

Mini-ATX, slightly smaller than Micro-ATX, targets smaller builds with essential features. It's used in compact desktops where full-size ATX isn't necessary, balancing functionality with space-saving.

DISCUSSION



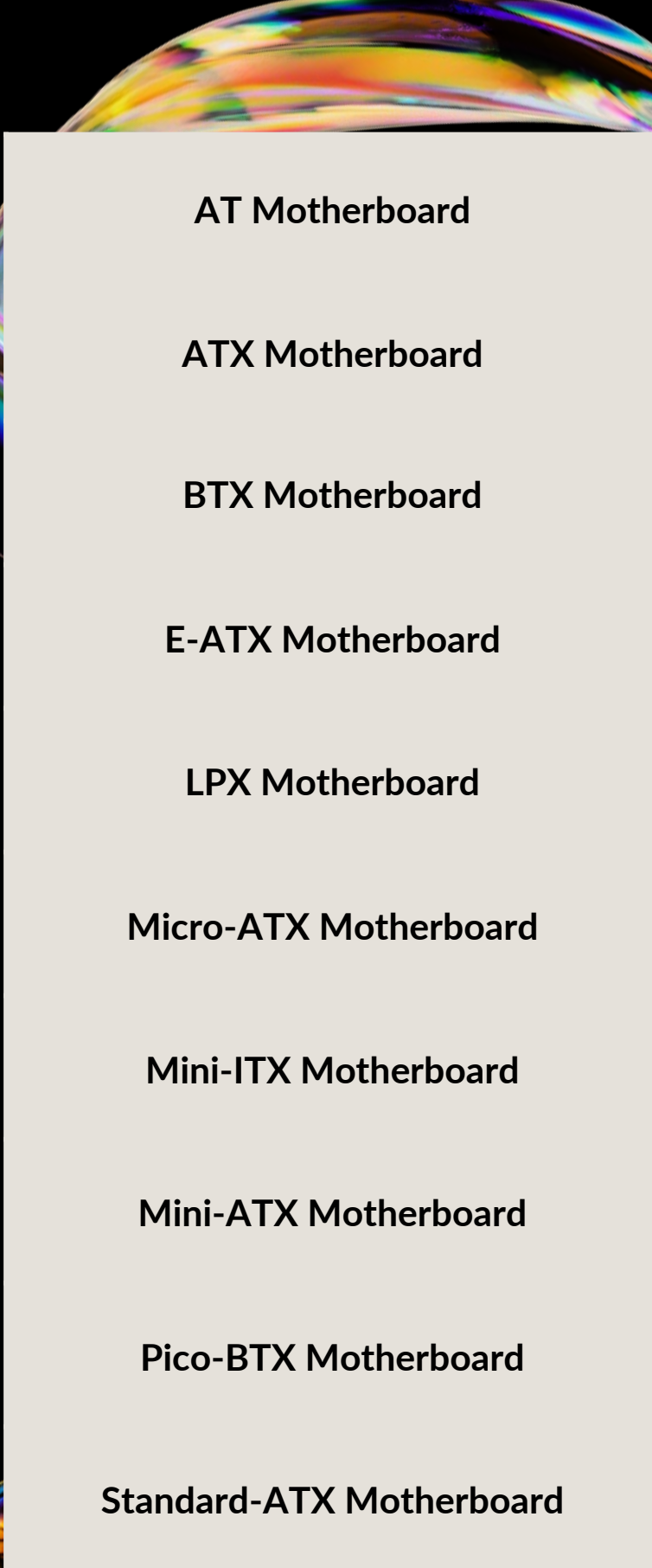
9 Pico-BTX Motherboard

Pico-BTX is an even smaller version of BTX, tailored for ultra-compact systems. Its limited space restricts PCIe slots, making it ideal for niche applications where minimal expansion is needed.

10 Standard-ATX Motherboard

Standard ATX boards maintain the balance between functionality and expandability with the full range of slots, making them versatile for most user needs.

	Build	CPU Slots	Memory Slots	Chipset
AT Motherboard	Large	1	2	Outdated
ATX Motherboard	Standard	1	4	Mainstream
BTX Motherboard	Standard	1	4	Limited adoption
E-ATX Motherboard	Extra-large	1	8+	High-end chipset
LPX Motherboard	Low profile	1	2-3	Basic
Micro-ATX Motherboard	Medium, compact	1	4	Mainstream
Mini-ITX Motherboard	Compact	1	2	Basic/mainstream
Mini-ATX Motherboard	Smaller than Micro-ATX	1	2	Basic
Pico-BTX Motherboard	Ultra-compact	1	1-2	Limited
Standard-ATX Motherboard	Standard	1	4	Mainstream

	BIOS/UEFI	PCI Slots	SATA Ports	Built-in Features	
	AT Motherboard	Legacy BIOS	Limited	Limited	Basic I/O
	ATX Motherboard	UEFI	Multiple	4-6	Expandable, robust I/O options
	BTX Motherboard	UEFI	Limited	4-6	Improved airflow design
	E-ATX Motherboard	UEFI	Extensive	6-8	Dual CPU support, high expandability
	LPX Motherboard	Legacy BIOS	Limited	2-4	Compact, minimalistic design
	Micro-ATX Motherboard	UEFI	Moderate	4-6	Cost-effective, moderate expandability
	Mini-ITX Motherboard	UEFI	1	2-4	Small form factor, efficient power use
	Mini-ATX Motherboard	UEFI	Limited	2-4	Compact desktop setups
	Pico-BTX Motherboard	UEFI	1	1-2	For specialized small systems
	Standard-ATX Motherboard	UEFI	Multiple	4-6	Widely compatible, balanced features



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