Difference between SRAM and DRAM

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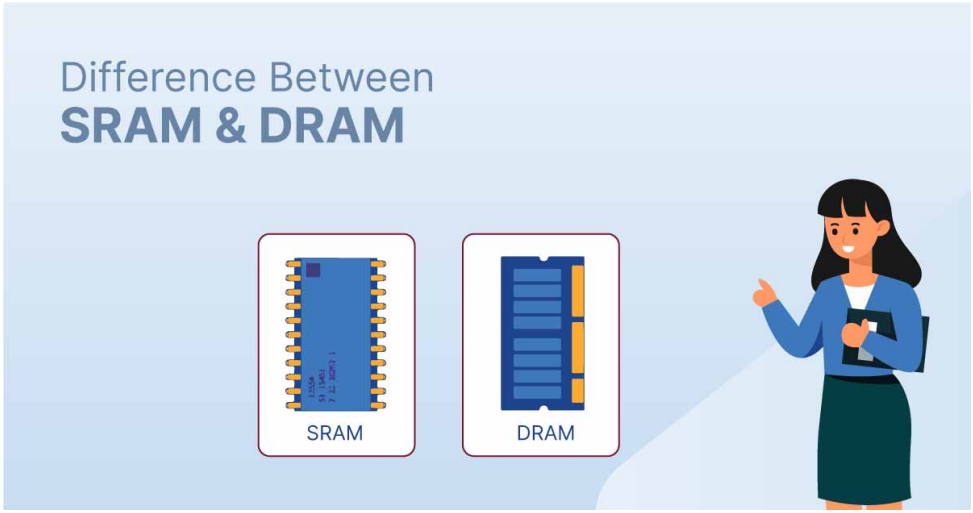
The main difference between SRAM (Static Random-Access Memory) and DRAM (Dynamic Random-Access Memory) is that SRAM stores data using flip-flop circuits, which are faster and require continuous power to retain data, while DRAM uses capacitors to store data, making it slower but more power-efficient as it needs periodic refreshing.



SRAM (Static Random-Access Memory) and DRAM (Dynamic Random-Access Memory) are two fundamental types of computer memory with significant differences. SRAM is faster and more expensive, while DRAM is slower and more affordable but crucial for system memory and storage. Both RAM types have their own set of advantages and disadvantages. Let's explore the difference between SRAM and DRAM.

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Comparison Table- SRAM vs DRAM

Parameters	SRAM	DRAM
Static	It does not need to be refreshed periodically.	It needs to be refreshed periodically.
Fast access	Faster access time	Slow access time
Power	Requires less power	Required more power
Density	High	Low
Cost	Expensive	Less expensive
Reliability	More reliable	Less reliable
Volatility	Volatile	Non- volatile
Size	Available in small size	Available in large size
Temperature	Good choice for applications that may be exposed to extreme temperatures.	Not suitable for such applications.

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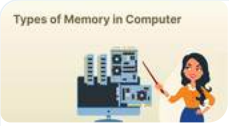
What is SRAM

Static Random Access Memory (SRAM) is a memory commonly used in computers and other electronic devices. SRAM retains its data without periodic refreshing, making it a faster and more reliable form of memory. As long as power is supplied to the memory chip, this type of semiconductor memory data remains constant. It stores data using a circuit made up of transistors and gates. Its features make it a good choice for critical applications, like aerospace and defence industries, where reliability and performance are crucial.

What is SRAM Full Form?

Here we will cover the SRAM which is one of the types of RAM. You will learn about SRAM types, applications, advantages, and disadvantages.



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Advantages of SRAM

Fast access time

This makes it well-suited for high-speed memory applications such as cache memory. The cache memory is a small, fast memory that stores frequently accessed data to quickly retrieve it without accessing the slower main memory. This helps to improve

the overall performance of the system.

High reliability

SRAM is known for its reliability. It does not need continuous data refreshing, making it less susceptible to data loss because of power failures. Hence, it is an excellent choice for military and industrial applications requiring data integrity.

Low power consumption

This makes it useful for battery-powered devices, where power consumption is a critical consideration. SRAM is also available in a denser configuration, making it useful for applications requiring a lot of memory in a small space.

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What is DRAM

Dynamic Random Access Memory (DRAM) is a type of memory commonly used in computers and other electronic devices. DRAM is named dynamic because it requires periodic modification and activity to retain data. It is employed in the implementation of main memory. This makes it a slower and less reliable form of memory but also cheaper and less power-hungry. DRAM uses a capacitor and stores every bit of data on the 2 different capacitors. It is the most efficient way to store

data as the space required for storing data is less than the static RAM.

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Advantages of DRAM

Speed

DRAM is faster than the other forms of memory your computer uses in general. For instance, when compared to your hard disc, it recalls data more quickly when using external devices like a thumb drive or optical drive. Users frequently access DRAM data who require quick access to keep their programs running well.

High Density and Less Power Consumption

DRAM can store large amounts of data in a small physical space. This is why it is widely used in various electronic devices, including computers, smartphones, and servers. Also, DRAM consumes less power than SRAM, making it useful for devices that need to run for long periods on a single battery charge.

Affordable

DRAM is less expensive per bit of storage than other types of memory. Due to its complex layout, SRAM costs more per GB. Further, DRAM prices have been dropping

for years, with manufacturers making it more affordable.

Difference Between RAM And ROM

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Key Differences Between SRAM and DRAM

- **Speed:** SRAM (Static RAM) is faster than DRAM (Dynamic RAM), offering quicker access to data.
- **Design Complexity:** SRAM is more complex, using six transistors per bit, whereas DRAM uses one transistor and one capacitor per bit, making it simpler.
- **Cost:** SRAM is more expensive to manufacture due to its complexity, while DRAM is less expensive.
- **Power Consumption:** SRAM consumes less power in idle state but more during read/write operations, whereas DRAM consumes a steady amount of power due to constant refreshing.
- **Data Volatility:** Both are volatile, but SRAM retains data as long as power is supplied without needing refresh cycles, unlike DRAM.
- **Usage:** SRAM is used for cache memory in CPUs due to its speed, while DRAM is used for main system memory, balancing cost and performance.

Conclusion

SRAM is faster, more expensive, less dense than DRAM, and primarily used as cache memory. DRAM is a type of memory that offers low cost and low power consumption but slower access time, typically used for main memory applications in computers and other electronic devices. Despite their advantages and disadvantages, we use both types of RAM depending upon the particular device condition and requirement.

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FAQs

What is the basic difference between SRAM and DRAM?

Which memory type is faster: SRAM or DRAM?

Which memory type is more expensive: SRAM or DRAM?

Which memory type has higher density: SRAM or DRAM?

Does SRAM or DRAM consume more power?

Which memory type is more stable: SRAM or DRAM?