

### **2.2.3 compare the two types of RAM, i.e. Static RAM (SRAM) and Dynamic RAM (DRAM):**

Here's a comparison between Static RAM (SRAM) and Dynamic RAM (DRAM):

<b>Feature</b>	<b>Static RAM (SRAM)</b>	<b>Dynamic RAM (DRAM)</b>
<b>Data Storage</b>	Stores data using flip-flops	Stores data in capacitors
<b>Volatility</b>	Volatile; loses data when power is off	Volatile; also loses data when power is off
<b>Speed</b>	Faster access time	Slower access time compared to SRAM
<b>Power Consumption</b>	Generally lower during access; no refresh needed	Higher due to constant refreshing needed
<b>Complexity</b>	More complex circuit design	Simpler circuit design
<b>Cost</b>	More expensive per bit	Less expensive per bit
<b>Usage</b>	Used for cache memory in CPUs and some high-speed applications	Used for main memory in computers and devices
<b>Density</b>	Lower density (less storage per chip)	Higher density (more storage per chip)

### **Key Differences:**

#### **1. Data Storage Method:**

- **SRAM:** Uses multiple transistors (typically 4-6) to store each bit, making it faster and more stable.
- **DRAM:** Uses a single transistor and a capacitor for each bit, requiring periodic refreshing to maintain data.

#### **2. Speed:**

- **SRAM:** Offers faster read and write times, making it suitable for cache memory.
- **DRAM:** Slower than SRAM, which can impact performance in tasks that require frequent memory access.

#### **3. Power Consumption:**

- **SRAM:** Consumes less power during operation as it doesn't need to refresh data.
- **DRAM:** Consumes more power due to the need for constant refreshing of the stored data.

#### **4. Cost and Density:**

- **SRAM:** More expensive and takes up more physical space, resulting in lower storage density.

- **DRAM:** Cheaper and denser, allowing for larger amounts of memory to be built in a smaller space.

### **Summary:**

- **SRAM** is faster, more reliable, and used in applications like CPU caches, while **DRAM** is more cost-effective and used as the main memory in computers and other devices. The choice between them depends on the specific needs of the application regarding speed, cost, and memory capacity.