Compare SDRAM, DDR, DDR2, DDR3, DDR4, and DDR5

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RAM (Random Access Memory) is one of the indispensable components of any computer system. RAM allows the access system to read-write randomly to any location in memory based on the memory address, so keeping data stored on RAM is only temporary, they will be lost when the power is turned off. Power supply. In addition, the larger the capacity of RAM, it means that it can hold data of more and more programs running in parallel on the system at the same time, so the device's multitasking capability will be smooth. , smoother.

1. 13 easy ways to free RAM make the machine run faster

However, RAM also has many types, suitable for many purposes and of course, different price segments.

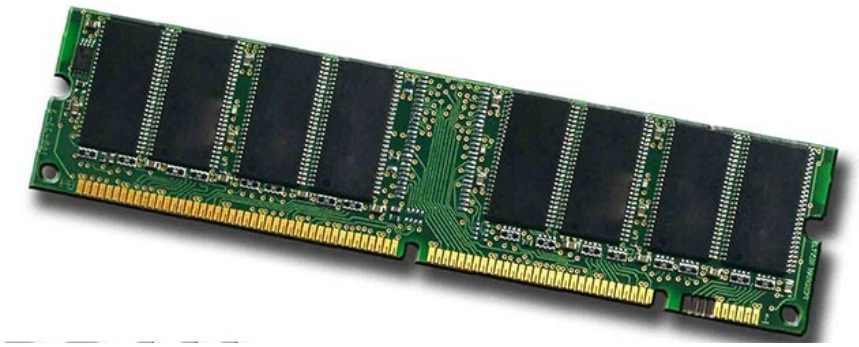
In this article, we will briefly learn about the differences between some of the most commonly used SDRAM types such as DDR1, DDR2, DDR3, DDR4, DDR5 and SDRAM itself.

RAM

1. SDRAM (Synchronous Dynamic Random Access Memory - Synchronous dynamic random access memory)
2. DDR SDRAM (Double Data Rate SDRAM - SDRAM dual data rate)

3. DDR2 SDRAM (Double Data Rate Two SDRAM - SDRAM dual data rate 2)
4. DDR3 SDRAM (Double Data Rate Three SDRAM - SDRAM dual data rate 3)
5. DDR3 SDRAM (Double Data Rate Fourth SDRAM - SDRAM dual data rate 4)
6. DDR5 - Monster of the future!

SDRAM (Synchronous Dynamic Random Access Memory - Synchronous dynamic random access memory)



It can be seen that the phrase "synchronicity" has somewhat to know about the behavior of this type of DRAM. Around the end of 1996, SDRAM began to appear in computer systems around the world. Unlike previous technologies, SDRAM is designed to automatically synchronize with CPU time. This allows the memory controller to capture the exact clock cycle when the required data is ready to use, so the CPU no longer has to wait in the middle of cycles. Memory access, thereby greatly improving the overall speed of the system. For example: PC66 SDRAM runs at 66MT / s, PC100 SDRAM runs at 100MT / s, PC133 SDRAM runs at 133 MT / s, .

SDRAM can be used to abbreviate SDR SDRAM (Single Data Rate SDRAM), in which, I / O, internal clock and clock bus are the same. For example, I / O, PC133's internal clock and clock bus are all 133Mhz. Single Data Rate means that SDR SDRAM can only read / write once in a clock cycle. In short, SDRAM can run at a higher clock rate than regular memory.

1. How to check RAM speed, type and capacity of RAM

DDR SDRAM (Double Data Rate SDRAM - SDRAM dual data rate)

The next generation of SDRAM is DDR. As the name suggests, we can also see that DDR SDRAM is an improvement of SDR memory with double the SDR transfer rate thanks to twice the transmission in a memory cycle, thereby doubling the data transfer rate. Data without increasing the clock frequency. Thus, the transfer rate

of DDR SDRAM is double SDR SDRAM without changing the internal clock. DDR SDRAM is basically the first DDR memory generation, possessing a prefetch buffer of 2 bits, double SDR SDRAM. Transmission speed of DDR ranges from 266 to 400 MT / s. DDR266 and DDR400 also belong to this type of RAM.

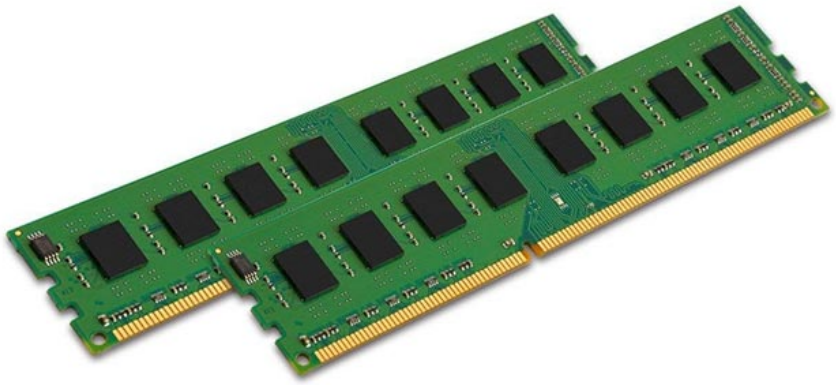
1. List of the best RAM for your computer should not be ignored

DDR2 SDRAM (Double Data Rate Two SDRAM - SDRAM dual data rate 2)

DDR2 is the second generation of DDR with the biggest advantage compared to DDR which is twice the bus speed, which is achieved thanks to the improved bus signal. DDR2's prefetch buffer is 4 bits (double that of DDR). DDR2 memory has the same clock rate (133 ~ 200 MHz) with DDR, but has a transfer speed of up to 533 ~ 800MT / s with an improved I / O bus signal. Various types of DDR2 533 and DDR2 800 memory are currently in common use on the market.

1. Top 5 RAM optimization software, enhance computer performance

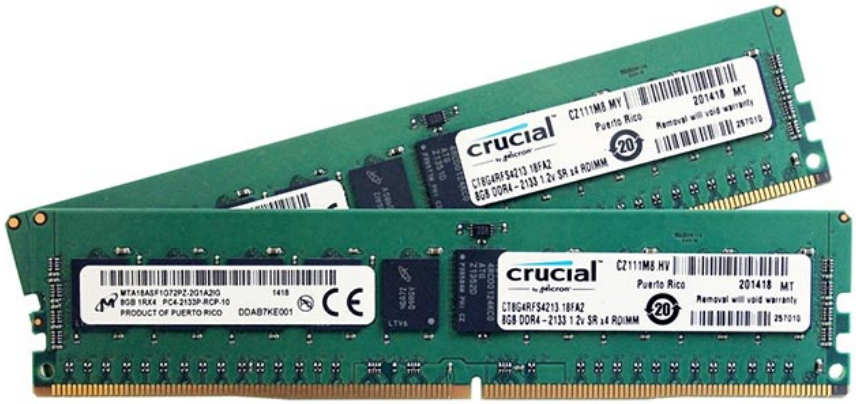
DDR3 SDRAM (Double Data Rate Three SDRAM - SDRAM dual data rate 3)



DDR3 memory reduces power consumption by up to 40% compared to current DDR2 modules, enabling lower current and operating voltage (1.5V, compared to 1.8V of DDR2 and 2.5 of DDR) . The transmission speed of DDR3 is about 800 ~ 1600MT / s. DDR3's prefetch buffer is 8 bits, while DDR2 is 4 bits and DDR is only 2 bits. In addition, DDR3 is also added with two functions, namely ASR (Automatic Self-Refresh) and SRT (Self-Refresh Temperature), which enable memory to control the refresh rate according to temperature changes. .

1. All things about RAM laptop and what you need to know

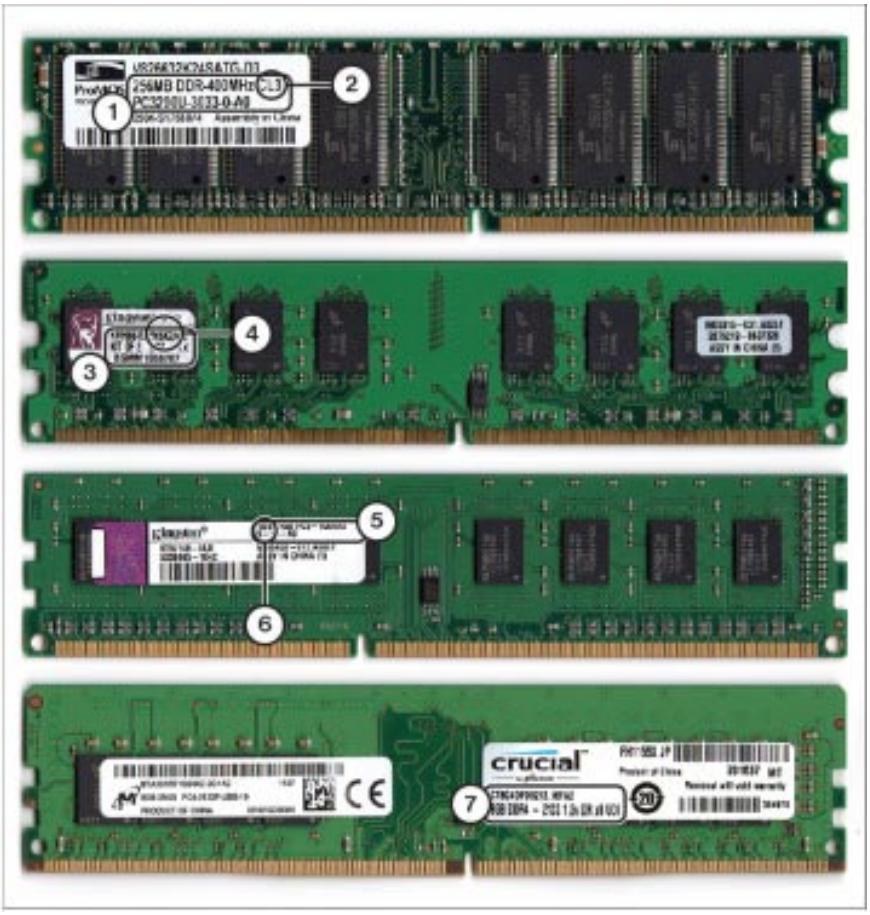
DDR4 SDRAM (Double Data Rate Fourth SDRAM - SDRAM dual data rate 4)



DDR4 SDRAM provides lower operating voltage (1.2V) and higher transfer rate than previous generations. The transfer speed of DDR4 is about 2133 ~ 3200MT / s, and it is also equipped with 4 new Bank Group technologies, in which each Bank Group has independent operating features. DDR4 can process 4 data in one clock cycle, so it is clear that this type of RAM is significantly better than DDR3. In addition, DDR4 is also added with some other useful functions, such as DBI (Data Bus Inversion), CRC (Cyclic Redundancy Check) and CA parity. These features can help enhance DDR4 signal integrity, also improve the stability of data transmission and access.

1. 10 best DDR4 RAM to improve PC performance

Here is the actual picture of the appearance differences between DDR, DDR2, DDR3, DDR4 (from top to bottom).

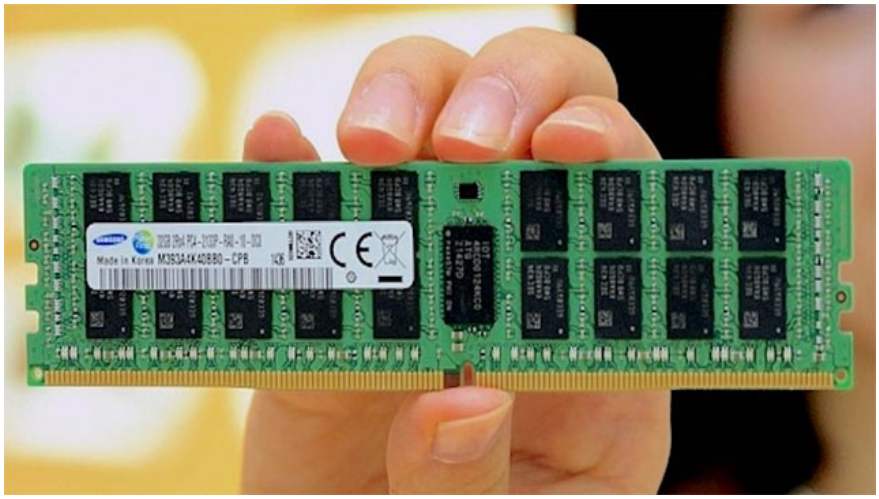


1. DDR 256 MB module, PC3200 (DDR400)
2. CL3 latency
3. DDR2 2GB module, DDR2-667 (PC2-5300)
4. Delay of CL5
5. DDR3 2GB module, PC3-10600 (DDR3-1333)
6. CL9 latency
7. DDR4 8GB module, DDR4-2133 (PC4-17000)

Table comparing basic specifications of SDRAM, DDR, DDR2, DDR3, DDR4, and DDR5:

DDR SDRAM Standard	Internal rate (MHz)	Bus clock (MHz)	Prefetch	Data rate (MT/s)	Transfer rate (GB/s)	Voltage (V)
SDRAM	100-166	100-166	1n	100-166	0.8-1.3	3.3
DDR	133-200	133-200	2n	266-400	2.1-3.2	2.5/2.6
DDR2	133-200	266-400	4n	533-800	4.2-6.4	1.8
DDR3	133-200	533-800	8n	1066-1600	8.5-14.9	1.35/1.5
DDR4	133-200	1066-1600	8n	2133-3200	17-21.3	1.2

DDR5 - Monster of the future!



What can we expect from these fifth generation DDR memory sticks? First of all, the further reduction in power consumption compared to DDR4 is one of the most basic elements that DDR5 should meet. Then there will be an increase (maybe twice as much) in memory bandwidth and capacity compared to DDR4. Besides, there are also rumors that DDR5 will be better priced than its predecessor DDR4. However, we will have to wait at least until 2020 to see the emergence of DDR5 on conventional computer systems.

Above are basic information about SDRAM, DDR, DDR2, DDR3, DDR4, and DDR5. Hope the information in the post is useful to you.

You finished reading the article "**Compare SDRAM, DDR, DDR2, DDR3, DDR4, and DDR5**" edited by the **TipsMake** team. We hope this article has provided you with many useful tech tips and tricks. You can search for similar articles on tips and guides. Thank you for reading and for following us regularly.
