Random Access Memory (RAM) has changed dramatically over the years mutating into different classifications as new ways to process data are found. Perhaps the most common RAM type that people are familiar with and use daily is a combination of Synchronous Dynamic Random-Access Memory (SDRAM) and DDR (Double Data Rate) memory. Today DDR RAM is utilized in most machines because of its fast speeds, ability to communicate with the CPU, and low power consumption. Although it is expensive to produce, its utility typically outweighs the price point.

SDRAM, which was first introduced in 1970, is synchronized with its clock speed as well as the CPU and motherboard. Synchronization allows for better read write speeds because it can communicate with the CPU and know when to process new data; the increased speed was a result of the CPU not having to wait when accessing the memory, which boosted the read and write speeds. This became known as Single Data Rate SDRAM (SDR SDRAM). The speed at which SDR SDRAM operated at was between 100 and 133 MHz, instead of calculating speed in nano seconds it was replaced with MHz.

SDR SDRAM was a steppingstone for the RAM we use in our everyday systems. Based upon the idea of a Single Data Rate SDRAM, the mighty Double Data Rate SDRAM (DDR SDRAM) was created. It utilizes a double pumping method to transfer data on both edges of the clock signal. This in-turn allows the doubling of data bus bandwidth. So, with the same clock frequency of SDR SDRAM, the DDR SDRAM will have double the bandwidth. DDR SDRAM had a 2 word per cycle limit in its amount of data transferred. As new versions of DDR SDRAM have come out over the years the things that change with each version is the increase in word count per cycle, frequency speeds, decreased power consumption, and increased transfer rates. Interestingly, the jump from DDR3 to DDR4 did not see a jump in words per cycle, it remained at 8. DDR5 is currently in production as well.

When looking at a stick of DDR SDRAM along with the frequency in MHz, addition information is included. Typically, it will have a format of PC (1-4)- number. The numbers after PC represent the DDR number, as in PC2 is equivalent to DDR2. The number that follows after the hyphen is the frequency of the RAM but in Bytes-per-second instead of transfers-per-second. This is just a much easier measurement to work with than typical transfers per second.

Sources:

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