Memory Modules FAQ

1. **How much memory is enough?**
   In this day and age, the demand for memory changes as new applications are introduced in the market every day. To know the right amount of memory varies according to the type of work you do and the type of software applications you're using. Today's word processing and spreadsheet work requires as little as 4 megabytes. However, systems equipped with 32 megabytes have become the low end assumption by software and operating system developers. Systems used for graphic arts, publishing, and multimedia call for at least 128 megabytes of memory and it's common for such systems to have 256 megabytes or more.

2. **What kind performance gain can I expect?**
   Samsung Semiconductor, Inc. commissioned a study by Laitron Computer Services to measure the effectiveness of memory upgrades on the speed, power and performance of today's personal computers. In contrast to past studies, which sought to identify the minimum memory requirements to successfully boot up various operating systems, this study investigated the actual increases in performance attributable to additional RAM. The results were remarkable. In fact, the Laitron tests showed boosts in performance of up to 63% in Pentium systems simply by adding RAM. Although the Samsung tests were performed on PCs, Macintosh users can expect similar results when adding RAM. Particularly with design programs like Adobe Photoshop and Illustrator, users can expect tremendous speed increases with screen redraws, the application of various Photoshop plug-ins, and most other time-consuming design procedures. As a general rule, to efficiently manipulate any Photoshop file, your system memory should be two to four times the size of the file. The cover art for this brochure is a 125MB file which was quickly assembled on a Mac with 512MB of RAM.

3. **Which memory module will work in my machine?**
   Zimmtronics has an online database of all major manufacturers memory requirements. This database enables you to find the exact parts you need to upgrade almost any machine.

4. **What is PC-133?**
   PC-133 is a faster main memory bus, transfering data at 133MHz. The bus is the main line of communication in a personal computer. Up to now, the fastest common PC bus speed has been 100MHz, so PC-133 represents about a 30% theoretical improvement in speed. Tests have shown a typical speed increase of over 20%.

5. **What is a SIMM?**
   SIMMs (Single Inline Memory Modules) come in powers of 2, i.e., 1,2,4,8,16,32, etc. They are about 1 inch by 5 inches in size, and snap into simm sockets on the system board (also called motherboard, mainboard, or baseboard).

6. **What is SDRAM?**

SDRAM is an acronym for Synchronous Dynamic Random Access Memory. The term "synchronous" means that the clock cycle of the memory is exactly synchronized by the clock cycle of the bus. Every calculation a PC makes is timed according to a clock ticking millions of times each second--it's clock cycle.

7. **What are DIMMS?**

DIMMs (Dual In-Line Memory Modules) closely resemble SIMM-type memory. Like SIMMs, most DIMMs install vertically into expansion sockets. The major difference between the two is that on a SIMM, opposing pins on either side of the board are "tied together" from one electrical contact; on a DIMM , opposing pins remain electrically isolated to form two separate contacts.

DIMMS are often used in computer configurations that support a 64-bit or wider memory bus. In many cases, these computer configurations are based on powerful 64-bit CPUs like Intel's Pentium or IBM's Power PC processor.

Small Outline DIMM's There is an another type of memory (commonly used in both notebook and laptop computers) is called Small Outline DIMM, or SODIMM. SODIMM is designed to accommodate the small areas available to memory in notebooks.

8. What is ECC?

ECC (Error Correction Code) is used primarily in high-end PCs and file servers. The important difference between ECC and parity is that ECC is capable of detecting and correcting 1-bit errors. With ECC, 1-bit error correction usually takes place without the user even knowing an error has occurred.

Depending on the type of memory controller your computer uses, ECC can also detect rare 2-,3-, or 4-bit memory errors. However, while ECC can detect these multiple-bit errors, it can only correct single-bit errors. In the case of a multiple-bit error, the ECC circuit reports a parity error.

Using a special algorithm (mathematical sequence) and working in conjunction with the memory controller, the ECC circuit appends ECC bits to the data bits and together they are stored in memory. When data is requested from memory, the memory controller decodes the ECC bits and determines if one or more of the data bits are corrupted.

If there's single-bit error, the ECC circuit corrects the bit. As mentioned, in the rare case of a multiple-bit error, the ECC circuit reports a parity error. If you see a 72-pin SIMM with x 39 or x40 width specification, you can be reasonably certain that the SIMM is designed exclusively for ECC.

9. What is EDO?

Extended Data Output, or EDO memory, is one of the innovations in DRAM chip technology. In computer systems designed to support it, EDO memory allows a CPU to access memory 10 to 15 percent faster than comparable fast-page mode chips. Computers designed to take advantage of the EDO speed advantage include those that feature Intel's Trinton chip set.

10. What is a 'parity' SIMM?

Parity vs. Non-parity: Some Macintoshes use nonparity simms (x8, x32), and most PCs use parity simms (x9, x36). However, the recent trend is toward using non-parity simms on many Pentium boards (such as the Intel) because the chances of a memory error are so small, it might be years before the first error occurs. If there is an error with a non-parity simm, you won't know about it unless you spot it in your computer files, or output data, etc. When an error is detected in a parity simm, the computer grinds to a halt, losing whatever you are working on. Another type is ECC (error checking and correcting) used on high-end servers, and these will self-check and fix any errors.

11. How do I know whether or not my SIMMs are parity?

If the simms in your computer have chips in multiples of 3 (or 9), then those are parity simms, and you need parity simms. If the simms have chips in powers of 2 (2, 4, 8, ...) then it's non-parity.

12. What is Credit Card Memory?

A "Credit Card Memory" is designed specifically for use in laptop and notebook computers. Because of its compact form factor, credit card memory is ideal for applications where space is limited. (Credit Card memory got its name because the form factor is the approximate size of the credit card.)

13. What is a Cache Memory?

Cache memory (pronounced Cache) is a special high-speed memory designed to accelerate processing of memory instructions by the CPU.

The CPU can access instruction and data located in cache memory much faster than instruction and data in main memory. For example, on a typical 100-megahertz system board, it takes the CPU as much as 180 nanoseconds to obtain information from main memory, compared to just 45 nanoseconds from cache memory. Therefore, the more instructions and data the CPU can access directly from cache memory, the faster the computer can run.

Types of cache memory include primary cache (also known as Level 1 cache) and secondary cache (also known as level 2 cache) . Cache can also be referred to as internal or external . Internal cache is built into the computer's CPU, and external cache is located outside the CPU.

14. What does 4x32 (etc.) mean?

Specification: Common 30 pin simms are 1MB-1x8, 4MB-4x8 (nonparity),1MB-1x9, 4MB-4x9 (parity); common types of 72-pin simms are 4MB-1x32, 8MB-2x32, 16MB-4x32 (nonparity) and 4MB-1x36, 8MB-2x36, 16MB-4x36 (parity). The "1x32", part is the simm specification, also referred to as "architecture", because it indicates the simm design in terms of number of chips on the simm, and density of those chips. If you multiply the 2 numbers out, you get the total number of megabits. Then divide by 8 (for nonparity simms) or 9 (for parity simms) to get the size in megabytes.

Speed: Most SIMMs are 60ns, which is standard; "ns" is nanosecond, (one billionth of a second), and refers to how fast the memory operates. Slower memory tends to cost a bit less, but speeds slower than 70ns are no longer commonly available. these days 60ns and 70ns modules often are used to upgrade older computer requiring only 80ns, 100ns, and even 120ns

memory.

15. What is a 'logic parity' or 'logic generator' SIMM?

Important: There is another type of simm known as "logic parity", and these are often advertised and sold as "parity", but they are not "true parity", they trick the system board into thinking they are parity simms, without doing any error checking. They're inferior and incompatible with many system boards (especially name-brand units) and are sold as cheaper parity simms. Other inexpensive simms (off-brand makes) are turning up on the market, and many of these are not up to spec. They may function on many common boards but fail to work on the higher-quality, higher-performance boards, such as Compaq, HP, IBM, Gateway, etc. To be safe, always request "Major Manufacturer" simms. We do not sell logic generators or certain other types of less reliable memory, and we do not deal in off-brand memory or "remakes."

What is the difference between CL2 & CL3 memory modules?

CL2 parts process data a little quicker than CL3 parts in that you have to wait one less clock cycle for the initial data. However, after the first piece of data is processed, the rest of the data is processed at equal speeds. Latency only affects the initial burst of data. Once data starts flowing, there is no effect. Bear in mind, a clock cycle for a PC100 module is 10 nanoseconds so you probably won't notice a significant performance difference. Most systems will accept either latency part. However, there are some systems that require either CL2 or CL3 parts. These requirements are built into our Memory Selector.

If you have further questions about memory stick, please contact Zimmtronics support team.

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