

## How can I test my memory

A defective memory module(s) can cause various issues on your computer. These are just a few of the possible issues you may encounter. It is important to remember the issues below can also be caused by more than just defective memory.

1. Computer doesn't boot and/or you get a beep code. Check your motherboard manual for the error code if you are unsure what it means.
2. Random computer crashes including BSOD (Blue Screen of Death), General Protection Fault error messages, Illegal Operations, Fatal Exceptions, etc.
3. Random Reboots.
4. OS or other application installation failure.

How can we be sure that the memory is defective before starting the RMA exchange process?

There are programs available that are designed to test the computer's memory. We recommend [Memtest86+](#) to test your computer's memory.

**Please visit this link to download and install Memtest86+ for an ISO image or USB Drive:**  
[Link](#)

To make a bootable Floppy from within Windows,  
First you would download the [memtest utility](#) to your HDD, then using [www.winzip.com](#) extract it to the same directory.

Please then get a floppy and do a fresh full format on it, and if there are any bad sectors just throw it away and get a new one. Then click on the install.bat file in the directory where you downloaded and extracted the files and follow the on screen prompts.

To make a Bootable CD from within windows you would download the ISO image that has a .zip extension. .tar would be for UNIX.

[Memtest.ISO](#)

Then use [www.winzip.com](#) to extract the ISO image to the same directory that you downloaded it to. Then using CD-R software you will burn the image to CD. Note: Do not copy the image; there is usually an option under file or burner to burn image.

**Note:** If you have recently added any new memory into the computer, we suggest you temporarily remove it to make sure it is not the cause of your issue before testing with Memtest. Please make sure you back up all the data from the USB drive before Memtest86+ installation as it will require a format.

## Corsair Memory Understanding Computer Memory Basics

**Q: First of all, what does DDR stand for?**

A: "DDR" stands for "Double Data Rate".

**Q: So what exactly is being doubled?**

A: With DDR, under optimal conditions twice as much data can be obtained from the memory subsystem during the same amount of time.

**Q: How does it do this?**

A: In most modern PCs, memory data is provided to the processor in "synchronous" fashion. This means that data arrives rhythmically, to the beat of a drum (a tick of a clock, in fact...). The memory clock is actually an electrical signal that bounces between two voltage levels, and shown in the picture to the right.

With standard SDRAM, data is transferred from the memory to the processor when the clock signal bounces from LOW to HIGH. With DDR, data is transferred not only when the clock signal goes from LOW to HIGH, but also when the clock signal goes from HIGH to LOW. Voila! Twice as much data on each tick of the clock!

**Q: I'm having a hard time visualizing this...**

A: The Ram Guy has been scratching his head for a week trying to think of a real world analogy to make "double data rate" easy to understand. A sharp stone and the resulting flat tire brought this one to light...

The Ram Guy likes road biking and mountain biking, and gets lots of flat tires because he weighs too much. Fortunately, he has a DDR tire pump that makes repairs easier! Where the old technology tire pumps put air in the tire only when you push the pump's plunger DOWN, the Ram Guy's new DDR pump puts air in the tire BOTH when you push the plunger DOWN, and also when you pull the plunger back UP. Twice as much air in each pumping cycle, meeting the inflation demands of today's high tech tires! Now do you get it?

**Q: I've heard of PC6400 and PC8500. What does this mean, and what is the difference?**

A: Well, this number reflects the memory module bandwidth. Since DDR DIMMs are eight bytes wide, the designation becomes  $PC800 * 8 = PC6400$  and  $PC1066 * 8 = PC8500$ . So, to repeat, PC6400 uses both edges of a 800MHz clock, and PC8500 uses both edges of a 1066MHz clock.

**Q: Everything else the same as SDRAM, i.e. registered vs. un-buffered, ECC vs. non-ECC, etc.?**

A: Yup...

**Q: What else do I need to know?**

Well, I think this is about it. At least, it's about all I know! But, as new stuff comes up, I will be updating

this bulletin. So, bookmark this page and check back often!

### **What, exactly, is TWINX?**

#### **Q: What are TWINX Matched Module Pairs?**

A: TWINX matched module pairs are kits of two XMS low latency modules which have been specially tested together in a dual channel test environment.

#### **Q: How is this extra testing done?**

A: Here's an example: To build the TWIN2X2048-6400, two fully tested and qualified CM2X1024-6400 modules are tested together in a dual channel motherboard at 400MHz/DDR800. If the modules pass the test, they can be sold as a TWINX pair. If they fail, they may not be sold as TWINX. Immediately following test, they are physically paired together, and packaged for shipment to the customer.

#### **Q: By the way, what are "dual channel boards"?**

A: Dual channel boards are motherboards based on chip sets that use two independent memory channels. These boards have two independent 64-bit channels to main memory to increase available bandwidth. Since the boards have two channels, for optimum memory performance modules should be used in identically configured pairs.

#### **Q: Does TWINX guarantee higher performance in dual channel boards?**

A: TWINX testing provides more of a reliability benefit than a performance benefit when compared with two off-the-shelf XMS Low Latency parts, by ensuring that the parts are of similar performance. But, TWINX does provide a large performance benefit to the "novice" enthusiast - it ensures that this user configures their dual channel system with a pair of modules rather than with a single module.

#### **Q: Who is will benefit from selecting TWINX modules?**

A: Novice enthusiasts are drawn to TWINX because it is a solution that is specifically targeted to their motherboard, and eliminates questions about module matching. More experienced users appreciate the fact that the modules are tested as a pair in a demanding dual-channel environment.

### **CAS Latency: What Is It, and How Does It Impact Performance?**

This is the question the RAM Guy gets asked more than any other question. So, I figured I'd put together a bulletin containing my \$0.02 worth!

#### **Q: First of all, what is CAS?**

A: "CAS" is short for "Column Address Strobe". A DRAM memory can be thought of as a matrix, kind of

like a spreadsheet with memory cells instead of numbers and formulas. Like the spreadsheet, each cell has a row address and a column address (like "AA57" or "R23C34" in the spreadsheet). As you might have guessed, there is also a RAS signal, which is shorthand for "Row Address Strobe".

**Q: And, what do you mean by "latency"?**

A: Latency refers to the time that you are waiting to get what you need. Merriam-Webster dictionary defines it as "the interval between stimulus and response".

**Q: Now, how does CAS work?**

A: To understand this let's walk through a simplified version of how the memory controller actually reads the memory. First, the chip set accesses the ROW of the memory matrix by putting an address on the memory's address pins and activating the RAS signal. Then, we have to wait a few clock cycles (known as RAS-to-CAS Delay). Then, the column address is put on the address pins, and the CAS signal is activated, to access the correct COLUMN of the memory matrix. Then, we wait a few clock cycles -- THIS IS KNOWN AS CAS LATENCY! -- and then the data appears on the pins of the RAM.

**Q: So, for CAS-4 you wait 4 clock cycles and for CAS-5 you wait 5 clock cycles?**

A: Bingo!

**Q: So, CAS-4 is 33% faster than CAS-5?**

A: There are a LOT of other factors in the memory performance. Here are a few of the main ones:

Sometimes you have to move to a different row in memory. This means activating RAS, waiting RAS-to-CAS delay, then doing the CAS latency thing.

Other times, you do a "burst" read, when you pull in a lot of data in one big block. In that case, CAS is only activated ONCE, at the beginning of the burst.

Also, don't forget the most important thing: processors have big caches! The cache is where the processor stores recently accessed instructions and data. The cache "hit rate", i.e., the percentage of times the processor finds the information it needs in its own cache, is typically greater than 95%!

OK, OK, so what's the bottom line?

So, the bottom line is, moving from CAS-5 to CAS-4 will offer a percentage performance increase in the low single digits for most applications. Programs which are known to be memory intensive (you gamers might know of some...) will see the best improvement.

**ECC: What Is It, and Why Would I Pay Extra For It?**

This is the question #2 for the Ram Guy. So, let me try to clear things up a little...

**Q: First of all, what does ECC stand for?**

A: "ECC" stands for "Error Checking and Correction".

**Q: And, what is "Error Checking and Correction"?**

A: Error Checking and Correction refers to a technology which allows a computer system to operate even if a memory error occurs.

**Q: Why do ECC modules cost more than modules without ECC?**

A: In order to check and correct the memory, additional RAMs are required. A non-ECC module which has eight RAMs would need to have a ninth RAM added; a sixteen RAM module would generally need to have TWO additional RAMs added. Obviously, the additional RAMs make the module more expensive.

**Q: So it's kind of like the old parity modules, right?**

A: Well, kind of, but ECC is a WHOLE LOT more useful. The ECC technology used on most x86-architecture PCs and servers is capable of correcting errors, where parity can only detect errors. If you've ever had an error "detected" on your system, you know the result - the blue screen of DEATH! Really useful, huh... With ECC you would sail right through, without crashing or even interrupting normal operation. Much more useful!

## **Corsair Memory Capacity Limitation of Windows 7**

The amount of memory which is usable by Windows 7 depends on your specific version. Here is a link to Microsoft's explanation: [Link](#)

Version	Limit on X86	Limit on X64
Windows 7 Ultimate	4 GB	192 GB
Windows 7 Enterprise	4 GB	192 GB
Windows 7 Professional	4 GB	192 GB
Windows 7 Home Premium	4 GB	16 GB
Windows 7 Home Basic	4 GB	8 GB
Windows 7 Starter	2 GB	2 GB

## **Corsair Memory Compatibility with AMD Platform**

There have been many questions about over clocking and or running at memory frequencies above DDR1333 and AMD has addressed this to some extent on [DDR3 Memory Frequency Guide](#) for example this chart is a great reference for how to set your memory frequency on an AMD based system and may help to better understand the basic limitations of your specific CPU and how high you can safely run the memory frequency.

### Memory Controller

1. The memory controller

- a. The memory controller is integrated into the AMD processor. The maximum speed supported varies by processor family and also limited by the amount of memory slots used.

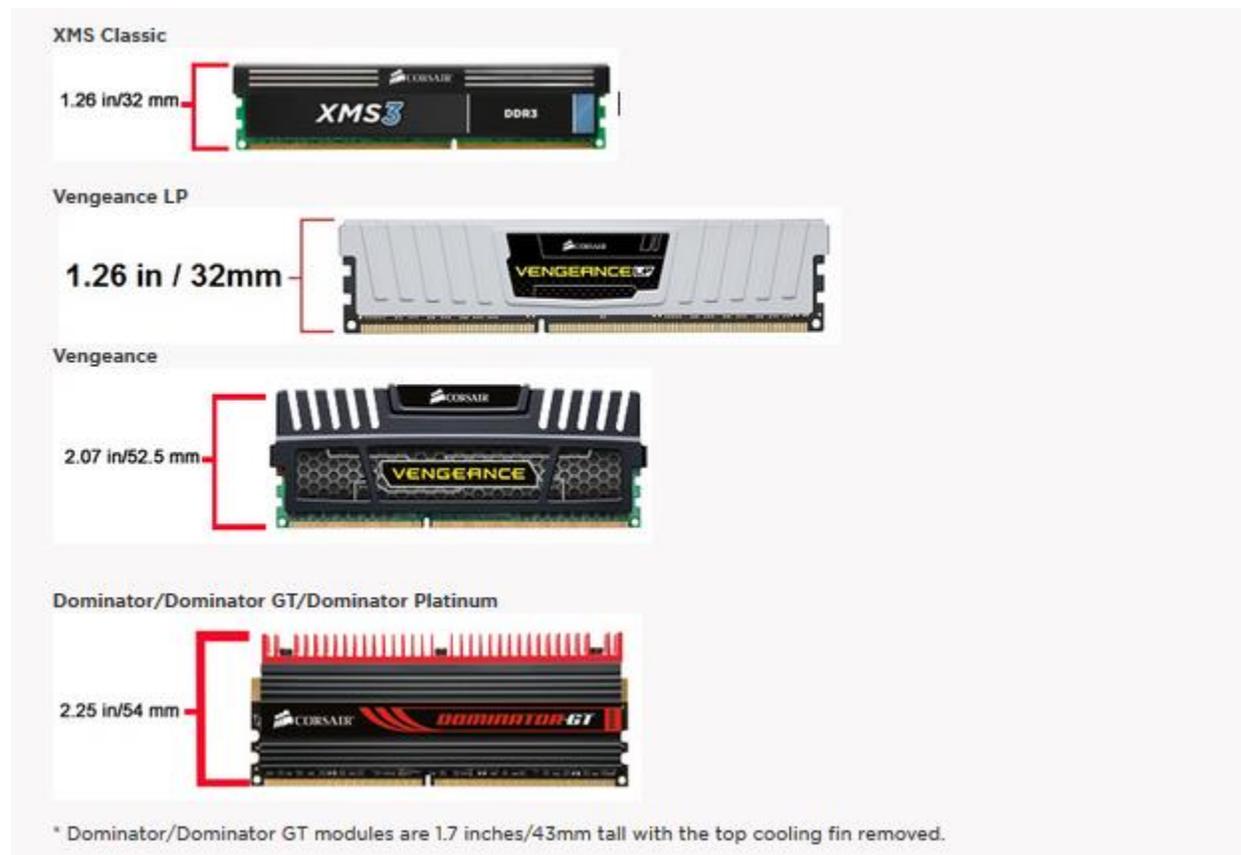
Available Motherboard Memory slots	Maximum memory speed supported				
	2	4	4	4	4
Populated memory slots	2	2	4	4	4
AMD processor			Using Single Rank memory	Using Dual Rank memory	Using mixed Dual and Single Rank memory
AMD FX™ processor	1866	1600	1600	1333	1333
AMD A8 & A6 Series APUs	1866	1600	1600	1333	1333
AMD A4 Series APUs	1600	1333	1333	1333	1333
AMD E-Series APUs	1066	n/a	n/a	n/a	n/a
AMD Phenom™ II	1333	1333	1333	1066	1066
AMD Athlon™ II X3 & X4	1333	1066	800	800	800
AMD Athlon II X2	1066	1066	800	800	800
AMD Sempron™	1066	1066	800	800	800

Depending on your selected motherboard and memory, the published speeds and configurations above may be exceeded, which will result in running your AMD processor outside of AMD published specifications. [See note](#). For details, please see the guidance below and contact your motherboard manufacture or memory supplier.

## Corsair Memory FAQ

### 1) How Tall is My Corsair Memory Module?

Corsair offers 4 heat spreader options for enthusiast memory; XMS Classic, Vengeance LP, Vengeance, and Dominator.



## 2) Which memory should I use with my AMD Phenom II CPU?

The Phenom II CPU is designed for the AMD AM3 Socket and supports dual channel DDR3 memory configurations. You can find memory designed and tested to run with the AMD Phenom II [here](#), or you can look up your motherboard on our [Memory Configurator](#) to get specific memory recommendations for your motherboard.

## 3) Can I use a triple channel memory kit on a dual channel system?

Absolutely, but we can't make any guarantees as to the performance of tri-channel modules in a dual channel system as they're not tested in this manner.

## 4) I have an X58 motherboard and my memory is not being fully detected, what's going on?

The first thing to check is to make sure each memory module is detected properly when installed individually in the system. If you only have detection problems when using more than a single module then you may need to make some adjustments to the settings in the BIOS. [Here is a link](#)

[to our forum](#) which should help you resolve the issue.

**5) What is XMP?**

XMP is a feature of most current motherboards using an Intel chipset (X58, P55, etc.) which allows for simple overclocking of your memory. Overclocked memory modules often must be manually configured in your BIOS in order to achieve the overclocked settings. A memory module which supports XMP (eXtreme Memory Profile) allows you to simply enable XMP mode in the BIOS which would then automatically configure your memory settings for the correct voltage, speed and latency values. Please contact your motherboard manufacturer to see if your motherboard supports XMP.

**6) Which Corsair Memory modules will work with my existing modules?**

We strongly recommend matching the module part number as closely as possible in order to ensure the greatest chance of compatibility. Even if you match part numbers properly, we can't make guarantees as to their performance as the modules weren't tested together. Also be aware that when using two kits of memory together, you may need to reduce the speed of the memory due to motherboard chipset limitations.

**7) I have 4GB of Corsair Memory (or more) installed on my machine but I see less than that in my operating system.**

This is a limitation of a 32-bit operating system. In Windows, the Windows memory manager is limited to a 4 GB physical address space. Most of that address space is filled with RAM, but not all of it. Memory-mapped devices (such as your video card) will use some of that physical address space, as will the BIOS ROMs. After all the non-memory devices have had their say, there will be less than 4GB of address space available for RAM below the 4GB physical address boundary.

MacOS X Tiger and Leopard are both 64-bit operating systems and will not experience this problem. Neither will 64-bit versions of Windows XP or Vista or Windows 7.

**8) The fan that came with my memory has started making noise, can I replace the fan under the warranty without sending my memory?**

Yes, the 3x 40mm fan part number is CMXAF1 and the 2x 60mm fan is CMXAF2.

**9) I purchased a set of memory and I noticed the timings set in the modules SPD is not set the tested spec of the modules; why not?**

The tested settings of any given part would normally need to be set manually and the modules SPD will be set to JEDEC standard for the specific part so they will post on any system with default voltage.

**10) Which memory should I use with my Intel Core i3 CPU?**

The Intel Core i3 CPU is designed for Intel Socket LGA1156 and supports dual channel DDR3 memory configurations. You can find memory designed and tested to run with the Core i3 [here](#), or you can look up your motherboard on our [Memory Configurator](#) to get specific memory recommendations for your motherboard.

#### **11) Which memory should I use with my Intel Core i5 CPU?**

The Intel Core i5 CPU is designed for Intel Socket LGA1156 and supports dual channel DDR3 memory configurations. You can find memory designed and tested to run with the Core i5 [here](#), or you can look up your motherboard on our [Memory Configurator](#) to get specific memory recommendations for your motherboard.

#### **12) Which Corsair Memory modules will be compatible with my computer/motherboard/laptop?**

You can look up your system or motherboard compatibility by using our Memory Configurator. [Click here](#) to use this utility.

#### **13) What are the settings for my Corsair Memory modules?**

The timings, voltage and speed for your modules can be found directly on the memory label, or on our [website](#) under the "Tech Specs" tab for your type of memory.

#### **14) I have two Corsair Memory modules that work fine together but when I add two more modules of the matching part number, they won't work.**

Each kit of Corsair Memory is tested to run at its advertised settings in the configuration in which they are sold. If you purchase a 4GB kit (2x2GB), then we can only guarantee its performance and compatibility when using it as a single kit. To ensure the best results with more than two memory modules installed in the same system, it is best to get a kit which has been tested to run in that configuration.

While it is definitely possible that two kits would run together in the same system, there is a chance that you may need to reduce the speed of the memory due to motherboard chipset limitations when populating more than one memory module per channel on the board. If you have problems mixing sets, it is suggested to manually lower the frequency of the memory.

#### **15) How do I properly install my Corsair Dominator Airflow fan?**

We have an excellent video illustrating the step by step process for installing the Dominator Airflow Fan on our [Youtube](#) page.

#### **16) Why won't multiple GTX modules run at their rated speed when running in dual or triple channel?**

These modules are sold as single modules and are only tested and guaranteed as single modules

at the rated speeds. You can purchase more than one and use them in a dual or tri channel configuration's but in most cases you would need to lower the memory frequency to keep the system stable. The more memory modules you have installed on any motherboard, the lower your overclocking results will be, due to the increased loading on the board.

### **17) How do I use memtest?**

There's a readme.txt file included in the package you download from memtest.org which will explain how to setup the program. We recommend using the default test on each module for two to three passes. This will take a while but it gives the modules the best opportunity to fail. For more information on how to use Memtest86, please view this [How To Use Memtest86](#) presentation.

### **18) I'm getting a blue screen/system hang/no post/reboots after installing my Corsair Memory.**

Please make sure your modules are set up properly in BIOS. You can find speed, latency and voltage settings directly on the memory label, or on our [website](#) under the "Tech Specs" tab for your type of memory.

If your modules are still giving you problems after setting voltage, timings and speed manually, you will need to test the modules one at a time using memtest from [www.memtest.org](http://www.memtest.org). For more information on how to use Memtest86, please view this [How To Use Memtest86](#) presentation.

### **19) Which memory should I use with my Intel Core i7 CPU?**

The Intel Core i7 CPU has two different versions. The is the i7-800 series and the i7-900 series. The i7-800 series is designed for Intel Socket 1156 and supports dual channel memory configurations. The i7-900 series is designed for Intel Socket LGA1366 and supports dual and triple channel DDR3 memory configurations. You can find memory designed and tested to run with the Core i7 [here](#), or you can look up your motherboard on our [Memory Configurator](#) to get specific memory recommendations for your motherboard.