How to safely stress test overclocked RAM, GPU and CPU

Stress testing tests the stability of your PC by pushing it to its limits. By the time you finish reading this article, you will be able to stress test your CPU, GPU, and RAM.

Stress testing is an important resource to have in your tech maintenance arsenal. Overclocking your PC can cause instability, and stress testing is designed to identify any issues before they occur during real-world use.

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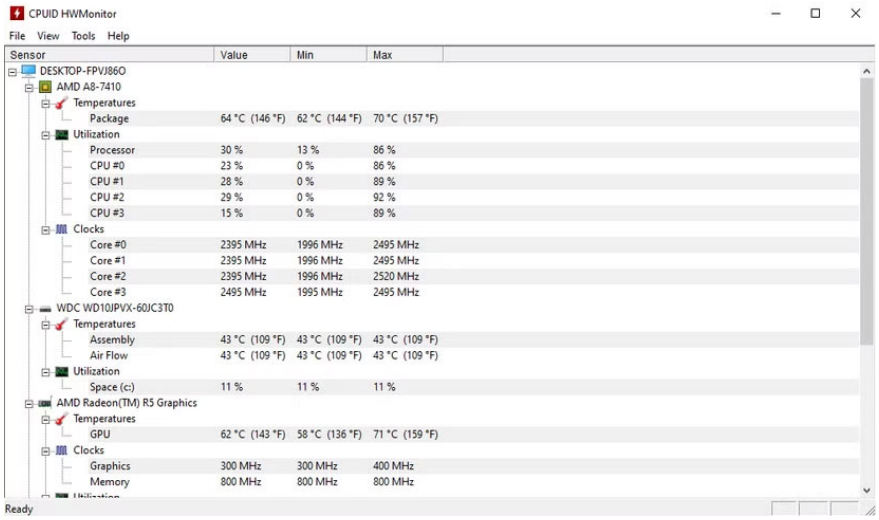
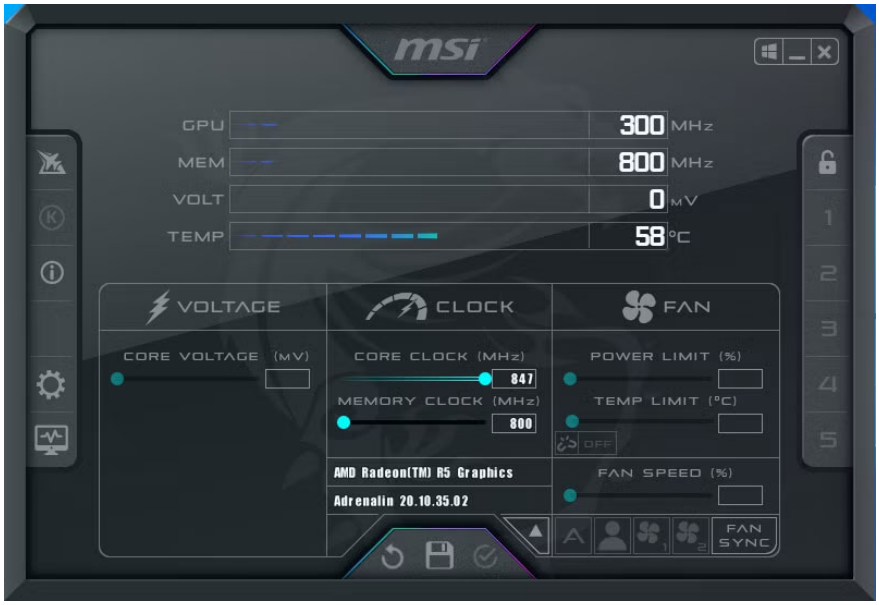
Use of monitoring program during stress testing

You will need to monitor your PC's temperature, voltage readings, and clock speeds to make sure everything is running smoothly. CPUID HWMonitor will help you by providing real-time temperature and clock speed readings.



When it comes to comprehensive monitoring software, MSI Afterburner stands out. Afterburner provides real-time temperature and usage stats, allowing you to control your GPU fan speed . This means you can cool down in real-time by increasing the fan speed of your GPU.



It is also a handy overclocking tool for your GPU. Keep a close eye on the temperature readings during stress testing.

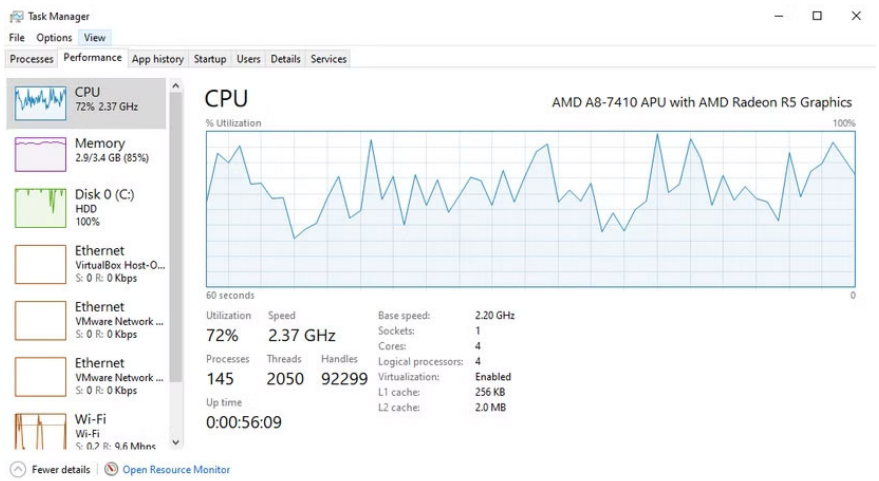
If your GPU temperature reaches 80°C with little or no activity, the stress test may overheat your PC before it can produce results. Therefore, consider cooling your PC before testing. Also, be sure to close all extraneous programs other than your monitoring software and stress test software .

Stress test tips

Stress testing may seem like a straightforward process, but stress testing properly requires a keen eye. Before you stress test, make sure to do the following.

1. Ensure hardware is at 100% utilization

Stress tests are not meant to test your performance. They are meant to maximize performance and see how your PC handles it. Make sure that your components, whether CPU or GPU, are running at maximum capacity during the test.



This tip may seem overly simple, but it ensures that you are testing your PC components at their maximum capacity. You can use any of the programs mentioned above to monitor your usage.

2. Check GPU clock speed again

Make sure you are stress testing your components at the correct clock speeds. Some software may stress test your PC properly but display incorrect clock speeds. This is where using multiple monitoring programs becomes important.

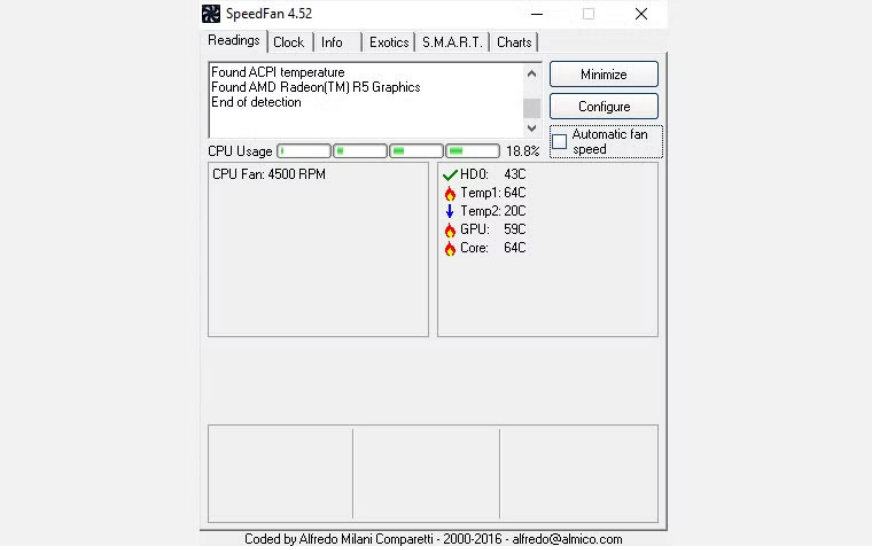
Incorrect clock speeds are often caused by forgetting to save the clock speed or setting it incorrectly. Clock speeds can also exceed their theoretical maximum limits, as is the case with Intel's Turbo Boost technology .

Intel's Turbo Boost software works by reducing the performance of some cores to increase the performance of one core beyond its theoretical maximum speed setting, providing higher on-demand processor performance under certain conditions.

AMD has a similar software called AMD Turbo Core that duplicates this service.

3. Keep the temperature as low as possible

Speedfan allows you to control the different fans in your PC. Increasing the fan speed will lower the overall temperature of your PC. It also allows you to monitor which fans are running and which are not. Some GPUs run their fans constantly, while others don't activate the fans until the GPU is used above a certain percentage.



Increase fan speed to about 70 to 80% if any component hits 80°C. Also, be sure to use multiple monitoring programs to ensure temperature readings.

Inaccurate temperature readings are usually a software problem, not a hardware problem. Most temperature readings are taken from the BIOS , which monitors the real-time temperatures of each PC component. The

monitoring software will carefully analyze these readings and display them in a convenient list.

If the software fails to parse these numbers or confuses them in some way—such as adding up every CPU core temperature reading instead of displaying each one individually, or displaying readings in degrees Fahrenheit instead of degrees Celsius—the software will provide incorrect temperature readings.

To detect false readings, you should consult multiple applications.

4. Research the ingredients

Before you stress test or overclock, remember that there are plenty of resources online that can help you. Doing a little research on your components will make the stress testing process a lot easier.

First, find the recommended overclocking settings for your components. Chances are, users have already stress tested and found stable conditions for their PC components. This will significantly reduce the time it takes to figure out a safe overclock.

Second, research whether it is safe to overclock your component. For example, Intel K-series CPUs allow for easy overclocking. However, non-K-series Intel CPUs do not have unlocked clock multipliers, making overclocking much more difficult and less safe.

5. Be ready to troubleshoot

The purpose of stress testing a PC is to push performance to the point of failure. While a PC crash may seem like a big deal, PC components will shut down before they cause serious damage. So if you're overclocking your PC, be prepared to deal with it.

PC crashes set a clear limit to your overclock. Then, underclock your PC to achieve a stable setting.

Stress test your components

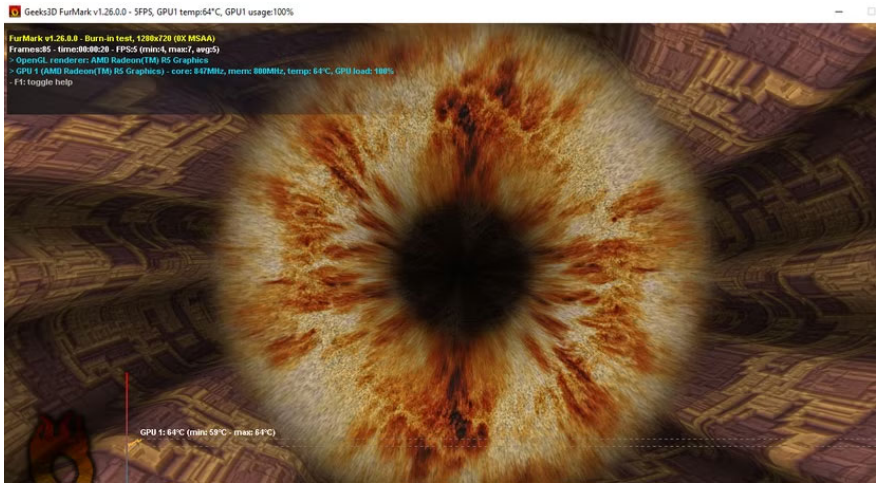
Now that you understand the purpose of stress testing and how to monitor your components during stress testing, it's time to put some stress on your components.

1. GPU stress test

Stress testing your GPU will cause one of two errors. Either your PC shuts down or you start seeing video stutter on your screen. Video stutter is a visual glitch on your screen that interferes with the image you see. These stutters are usually green or purple and indicate that your GPU is being pushed past its steady state.

Visual noise during stress testing indicates that you should reduce your overclock settings. When it comes to GPU stress testing, Furmark is a very popular brand. It is designed to put as much stress on the GPU as possible and does its job by displaying very high quality fur on your PC.

Once Furmark is complete, you'll be given a summary of your peak GPU temperature and a score rating. You can compare this rating to Furmark's library, comparing your PC usage to others.



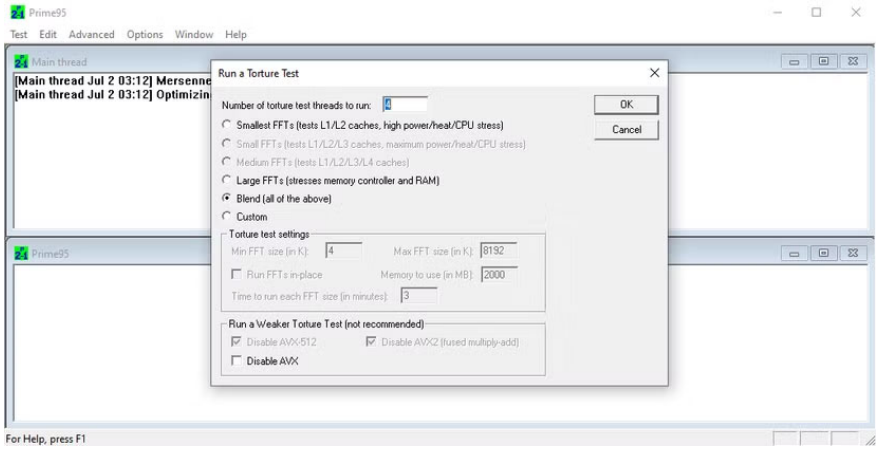
Other stress testing software, such as Unigine's Heaven or Valley, offer different ways to stress test your GPU. Some stress testing software will cause your PC to shut down, while others won't. It depends on how much stress each software puts on your GPU.

Try a few tests to make sure you're stress testing your PC thoroughly. GPU stress testing doesn't take as long as CPU testing, so running Furmark a few times should be enough to ensure stability.

1. How to stress test GPU with Furmark

2. CPU stress test

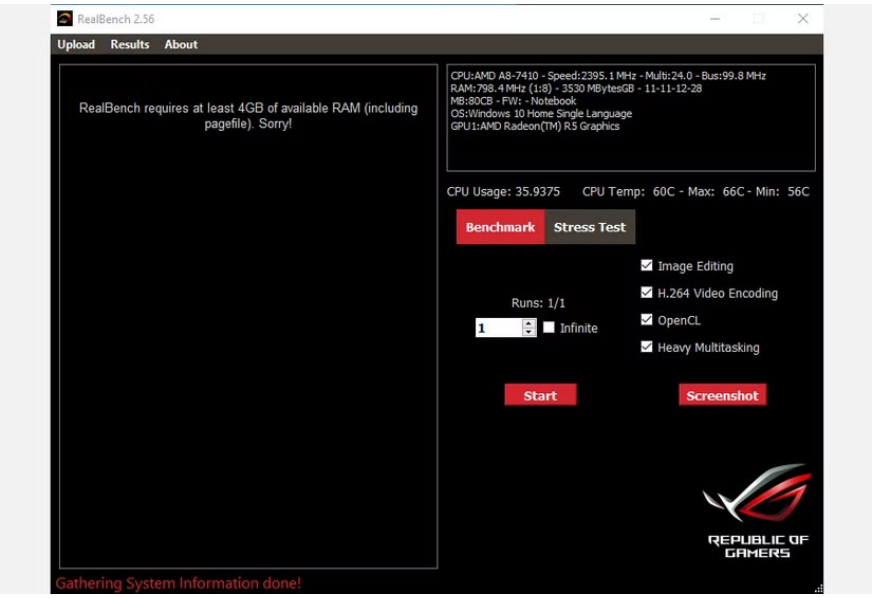
There is one indicator that the CPU stress test worked: It crashed. Prime95 is probably the most reliable software on the market. Prime95 is a client for the GIMPS (Great Internet Mersenne Prime Search) program, which attempts to find prime numbers as large as your processor.



There are three settings in Prime95. Small FFT provides a CPU stress test along with a small RAM test. Large FFT in place provides a harder CPU stress test, targeting maximum utilization and temperature readings. Blend is more RAM testing than CPU stress testing.

Large in-place FFTs provide the best stress test, making them the best choice. However, if you are new to stress testing, consider running small FFTs and monitoring the temperature readings. If your CPU does not maintain its temperature properly during this test, large in-place FFTs can overheat your PC.

RealBench also offers a robust CPU stress test and uses real-world actions like photo editing and video editing for its testing methods. Unfortunately, the official website is down for some reason. But you can download the software from third-party sources, such as TechSpot.



The longer these stress tests last, the more likely your PC is to crash. An overnight test in Prime 95 is best for accurate results, but running the test for 3-4 hours will ensure that your CPU doesn't become unstable and can handle heavy loads throughout the day. OCCT, which stresses your PC as much as any other program, also provides a handy monitoring interface for tracking temperature, clock speed, and CPU usage over time.

3. Stress test RAM

RAM stress testing serves a similar purpose to other component tests, although it is typically performed to check the stability of components out of the box. A faulty RAM module can severely limit your PC and lead to frequent, random shutdowns.

Memtest86 runs tests on your RAM, checking for any errors. If your PC is randomly shutting down, chances are the RAM in your PC is the culprit. Memtest86 will identify these errors, saving you the cost of buying a whole new PC.

Unfortunately, this program cannot be run from your regular operating system. Instead, you will need to install the program onto a separate flash drive and boot from your flash drive to run Memtest86.

Download a program labeled Auto-installer for USB Key to install Memtest on your drive. When Memtest starts, it will scan your RAM for errors. If Memtest doesn't find any errors with the installed RAM, your RAM is ready.

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