



FAQs for the Chrome S20 Series

Here are answers to the most frequently asked questions about S3 Graphics advanced multiple GPU technology.

FAQ 1. *What is MultiChrome and how does it work?*

A MultiChrome is S3 Graphics' advanced multi-graphics processor technology that combines two GPUs (Graphics Processing Units) into a single high performance GPU. Introduced with the Chrome S20 Series, MultiChrome enables low cost and high performance scalable graphics acceleration without the need for any inter-GPU or inter-board proprietary cables or connectors and without restrictions requiring the use of proprietary motherboards. As a simple-to-use and low-cost technology, MultiChrome leverages high speed PCI Express (PCIe) bandwidth by using Peer-to-Peer transfers for fast inter-GPU communication as a means to achieve the promised performance.

FAQ 2. *How is MultiChrome different from other multi-GPU solutions?*

A Other current multiple-GPU solutions also use multiple PCIe graphics cards to accelerate graphics for PC video games and applications. But because these solutions use some sort of proprietary GPU-to-GPU cables or connectors, or only work on specific motherboards, implementation is either complex or obtuse for the consumer. This translates into higher cost and greater user frustration. MultiChrome requires no proprietary or additional hardware other than the two graphics cards. This translates into lower cost and a better user experience.

FAQ 3. *Is there dedicated Hardware or is it just Software?*

A Yes. S3 Graphics' design team has endowed the Chrome S20 Series GPUs with some unique hardware features. The software driver takes advantage of these features to enable the performance increases seen when in MultiChrome mode. It is the combination of hardware and its supporting software that makes MultiChrome for the Chrome S20 Series an effective and powerful multi-GPU solution.

FAQ 4. *What rendering modes are supported in MultiChrome?*

A Two rendering modes are support in MultiChrome: AFR (Alternate Frame Rendering) and SFR (Split Frame Rendering). Chrome 20 Series MultiChrome software automatically selects the most optimum mode to achieve the highest performance gain whenever MultiChrome mode is enabled. AFR is usually preferred and is the most efficient rendering mode for most PC video games run in multi-GPU configurations.

FAQ 5. *What graphics cards support MultiChrome?*

A Graphics cards with S3 Graphics Chrome S27 Series and Chrome S25 Series graphics processors support MultiChrome.

FAQ 6. *Can I mix and match graphics cards for MultiChrome?*

A For maximum acceleration with MultiChrome technology, use of matched pairs of graphics cards is recommended, where each add-in graphics board has the same Chrome S20 Series processor, the same clocks and memory configuration.

Different GPUs, clocks, and memory configurations can be supported – however, the MultiChrome configuration (as with other multi-GPU configurations) will default to the lowest common denominator of the two different graphics cards. Therefore, for maximum acceleration, use two identical graphics boards.

For each card an identical version of a S3 Graphics MultiChrome-capable software driver must be installed.

FAQ 7. *What motherboards will support MultiChrome?*

A One of MultiChrome's key advantages is its cross-vendor compatibility. MultiChrome does not require any proprietary dual-GPU motherboards to be used. MultiChrome has been tested and found compatible with various leading edge dual-GPU motherboards on the market.

With some motherboards, especially older ones, an adjustment setting may be needed for a System BIOS configuration option, or a jumper setting or a PCIe selector card. Motherboard documentation provided by the vendor will identify which adjustments need to be

made, if any, for that particular motherboard. Newer motherboards usually do not require such adjustments.

Additionally, there are some motherboards that are not compatible with MultiChrome because they simply do not allow other dual-GFx cards to operate on their motherboard. This is an issue with the system BIOS, not the GPU, so those specific types of motherboards have not been found compatible.

FAQ 8. *What power supply do I need to support MultiChrome?*

A Multi-GPU solutions from other graphics vendors on the market today require an upgrade of the existing power supply because a more powerful and expensive power supply is needed to supply the extra power consumption needs of their multi-GPU solutions. The user also has to meddle with the two extra auxiliary power cables in an already crowded system to configure the multi-GPU cards correctly. MultiChrome technology, with its inherent low power consumption, requires no additional auxiliary power connection to work at its highest performance level.

MultiChrome's thermal characteristics are much lower than the competitive solutions that exist today. MultiChrome users can achieve high performance at low cost in a quiet environment.

FAQ 9. *Does MultiChrome require the use of proprietary cables or connectors?*

A No. Current competitive multi-GPU solutions require the use of a proprietary bridge connector or a complex external cable system with video loop-through and external capture/re-composition engines to achieve the performance level promised with their technology. Apart from the obvious cost burden that these custom solutions impose on the retail graphics add-in board consumer, these solutions further add complexity to installation and maintenance.

The advanced open platform, cable-free architecture introduced with MultiChrome technology leverages the high speed PCIe bandwidth using Peer-to-Peer transfers for fast inter-GPU communication to achieve its performance advantages. It does not require any special cables or connectors.

FAQ 10. *How many games have been optimized in the driver for MultiChrome?*

A Currently, there are over 50 popular PC video games that have been optimized in S3 Graphics' MultiChrome-capable software. More are constantly being added as new games and game updates become available.

FAQ 11. *How many games have been tested for game compatibility on MultiChrome?*

A To date over 100 PC video games and game editions have been tested for compatibility with MultiChrome. Testing of new games is routinely done to continue to provide an optimum MultiChrome experience. Many popular PC video games work out-of-the-box with MultiChrome.

Popular PC video games that have been optimized in the driver to take full advantage of MultiChrome will show the most performance gain.

FAQ 12. *What kind of performance gain can be expected with MultiChrome?*

A Performance improvements can range from 60% - 80% for MultiChrome driver-optimized PC video games depending upon the game or application and system configuration.

FAQ 13. *Why don't all games and applications scale with MultiChrome?*

A Generally speaking, most PC video games and applications have not been written in a manner which targets multi-GPU acceleration. As such, these PC video games and applications may be dependent on operations which are inherently inappropriate for rendering in other environments.

PC video games and applications that are GPU bound will see the greatest benefit from using multiple GPUs and will see the greatest performance increases over PC video games and applications that are CPU bound. For PC video games and applications that are CPU bound, the addition of a 2nd GPU will have little to no benefit as the 2nd GPU is not fully utilized.

FAQ 14. *What Operating Systems support MultiChrome?*

A Currently, 32-bit and 64-bit Windows are supported. Other operating systems will be supported in the near future.

FAQ 15. *Which driver should be used for MultiChrome?*

A Please refer to our website at www.s3graphics.com for the latest MultiChrome driver.

FAQ 16. *Does MultiChrome require re-booting the system when switching from MultiChrome to non-MultiChrome mode?*

A MultiChrome technology allows you to select MultiChrome or non-MultiChrome mode without having to re-boot the entire system. The MultiChrome software will automatically select the most optimum mode of operation to achieve high performance. Selecting or de-selecting the mode of operation is done through a simple menu. Constantly having to re-boot the system between multi-GPU and non-multi-GPU configurations certainly would be a great nuisance.

FAQ 17. *How many monitors are supported in MultiChrome mode?*

A In MultiChrome mode, up to 3 monitors are supported: CRT, DVI (LCD), and TV/HDTV, with only two being active simultaneously at a time.

FAQ 18. *How many monitors are supported in non-MultiChrome mode?*

A In non-MultiChrome mode, up to 6 monitors are supported: one each of CRT, DVI (LCD), and TV/HDTV on each of the 2 graphics boards. Only two of the display devices attached to each graphics board can be active at the same time.

Switching between configuration output options in non-MultiChrome mode does not require a reboot of the system. Users can enjoy the functionality of 2 separate GPU configurations each with its 2 independent GPUs attached to up to 6 possible display connections, 3 per GPU.