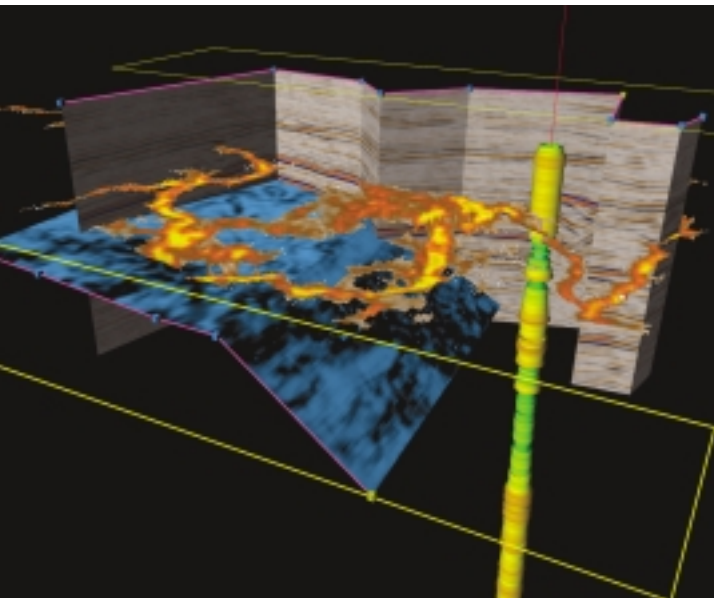
Datasheet

InfiniteReality4™ Graphics

The Ultimate in Visual Realism

Features

- Breakthrough visual realism with image-based rendering and interactive volume visualization
- Incredible image fidelity with 1Gbyte texture memory, 10Gbyte frame buffer, and over 192Gbytes per second of internal bandwidth per graphics pipeline
- Scalable performance and displays with up to 16 graphics subsystems and over 130 million pixel displays from a single SGI Onyx family system
- Universal access to advanced vizualization with Visual Area Networking
- Binary compatibility with other SGI Onyx



Real, Not Imagined

Creativity and insight are limited by our understanding of today's reality and our ability to create tomorrow's. InfiniteReality4 graphics gives you the visual realism, advanced features, and performance needed to see things as they are and how they could be. Whether you are designing the next-generation sports car, uncovering new petroleum reserves, or creating the next blockbuster movie, InfiniteReality4 graphics lets you and your team go beyond the limitations of computer graphics and unleash the power of advanced visualization.

A Breakthrough in Visual Realism

Making the leap from imagined to real requires more than polygons and pixels per second; it demands an integrated approach to graphics hardware, software, and system design that is only available with InfiniteReality4 and SGI® Onyx® family visualization supercomputers. Stunning realism is only achieved when hardware and software are designed together and work in concert to render compelling imagery and maintain the physical truthfulness behind it. Techniques such as image-based rendering, dynamic shaders, and interactive volume rendering are possible because SGI® APIs are designed to exploit the advanced features of SGI Onyx family systems with InfiniteReality4 graphics.

Industrial Strength

InfiniteReality4 enables competitive breakthroughs in every industry where users have to work with unpredictable environments. InfiniteReality4 delivers photo-realistic scenes of any data, from any perspective, not just along predetermined paths.

- Energy: Individual seismic analysts or asset teams are many times more productive because InfiniteReality4 gives them 1Gbyte of texture memory, and interactive volume visualization and scalable displays allow them to optimize decisions across entire fields.
- Government: More effective simulation and training for military and homeland security are enabled through increased model complexity, image-based rendering, and full-scene 8 subsample anti-aliasing.
- Manufacturing: Companies experience shorter time to market with better products because designers can create more accurate depictions of future products using advanced shader and image-based rendering techniques and display them in high-resolution, life-size environments.
- Sciences: Researchers achieve differentiated results in chemistry and pharmaceutical research, medicine, physics, and engineering through the study of more complex phenomena and the development of higher-quality virtual environments.
- Media: Higher impact on-air HD and SD graphics, more creative and realistic virtual sets, and higher performance editing and compositing solutions using 4 8-bit RGBA color and real-time colorspace conversion.

No Bottlenecks or Limitations

Our eyes see over 9 million pixels of information, so why be content with computer graphics that display 1 million or 2 million pixels? Each InfiniteReality4 graphics pipe can display more than 8 million pixels of visual information using up to eight separate display channels to fully immerse a user or team in their data. Furthermore, the design of SGI Onyx family systems provides the computational power and I/O and graphics bandwidth to support up to 16 InfiniteReality4 graphics pipes on a single system, so a small team or a large audience can experience photo-realistic visualizations with up to 130 million pixels of display. There are no bottlenecks or limitations since high-resolution data can stream from disk, be processed, and be displayed in real time—and the advanced real-time design of the IRIX® operating system means that time-critical response is guaranteed.

Universal Access to Advanced Visualization

Visual Area Networking enables anyone with a networked computing device to access the power of an SGI Onyx family system. Interactive applications that take advantage of advanced graphics, computing, and I/O power are now available to SGI, Sun™, Linux®, and Windows® desktops and mobile computing users without any modifications to underlying software. Visual Area Networking is the perfect complement to InfiniteReality4 graphics since it enables technical and creative professionals to take their most powerful tool with them wherever they go.

High-Performance APIs Make the Development of Differentiated Software Applications a Snap

SGI has a complete portfolio of advanced visualization software optimized to work with InfiniteReality4 graphics. Whether you are developing software for flight simulation, seismic analysis, photo-realistic design review, or the latest in film editing and special effects, SGI has software designed just for you. It doesn't matter if you are starting from scratch or adding new features into existing code; software developed by SGI makes it easy to differentiate your solution from the crowd. And, when combined with Visual Area Networking, it allows you to deliver the results direct to any desktop or mobile computing device.

Binary Compatibility Ensures Immediate Impact

InfiniteReality4 graphics maintains binary compatibility with previous generations of InfiniteReality® family graphics so your existing advanced visualization applications run faster and better than ever before. Furthermore, SGI protects your existing investment in advanced visualization systems by making it easy and affordable to upgrade InfiniteReality family graphics in your existing SGI® Onyx® 3000 series, SGI® Onyx® 300, and Silicon Graphics® Onyx2® systems without changing the underlying system hardware or applications software.

InfiniteReality4
Technical Specifications

Features

- Architecture: InfiniteReality with Geometry Engine®, Raster Manager, and Display Generator subsystems
- Host Connection: XIO™ channel—dedicated 1.6Gbyte/sec/pipe
- Scalability: 1–16 InfiniteReality4 graphics pipes, each with 1, 2, or 4 Raster Managers
- Texture Memory: 1Gbyte of dedicated 2D/3D texture memory/pipe
- Frame Buffer: 2.5Gbytes of dedicated frame buffer per Raster Manager, up to 10Gbytes/pipe
- Display Resolution: Up to 8.3M pixels/pipe and 133M pixels/system
- Display: 2-channel RGBHV output, one S-Video output, genlock with internal or external sync, hardware swap synchronization for multiple graphics pipes
- Display Options: 6 additional RGBHV output channels (8 total), high-definition and standard-definition graphics-to-video output with real-time colorspace conversion, digital-video multiplexer, hardware-in-the-loop interface
- Anti-Aliasing: True 4 or 8 subsample full-scene anti-aliasing selected from a 64-element grid with per-pixel samples variations to maximize image quality
- Color Fidelity: 48-bit RGBA for up to 68 billion colors
- Stereo: Quad-buffered active and passive stereo with stereo emitter connections
- Image-Based Rendering: Eyepoint-independent photo-realistic rendering
- Clip-Mapping: Hardware-accelerated clip-mapping
- Volume Rendering: Interactive volume rendering using texture lookup tables and 1Gbyte volumes from texture memory or unlimited volume sizes when paged from system memory or disk
- Imaging: Hardware-accelerated convolutions

Performance

- Texture Fill: 8 subsample pixel fill at 1.29G pixels/sec per pipe or up to 20.6G pixels/sec/system
- Volume Rendering: Up to 800 Mvoxels/sec/pipe and 12.8 Gvoxels/sec/system
- Image Processing: 15.3M 5x5 RGBA convolutions/sec/pipe and 244M/system
- Texture Download: Up to 336Mbytes/sec

Software

- System: IRIX® 6.5.17 or later, REACT™ real-time extensions
- Graphics: XI1 R6, Motif Window Manager, OpenGL® 1.1 with SGI imaging extensions, OpenML™
- OpenGL Performer™: Multipipe scene graph with support for image-based rendering, clip-mapping, real-time texture paging, and integration of other SGI APIs
- OpenGL Shader™: Dynamic, parameterized multipass shaders compiled from a high-level image shader language
- OpenGL Volumizer™: Interactive volume rendering including multiresolution volumes, volume roaming, volume shading, volume paging from disk, multipipe display, and performance scaling
- OpenGL Optimizer™: Large-model viewing and manipulation scene graph with support for higher-level primitives, hidden object removal, tesselators, simplifiers, multipipe displays
- OpenGL Vizserver™: Visual Area Networking, which provides universal access to advanced visualization, remote access, multiuser collaboration, application transparency, client support for IRIX, Sun, Linux and Microsoft® Windows
- OpenGL Multipipe™ Software Development Kit: Toolkit for creating new applications or modifying existing ones to work in SGI® Reality Center™ environments
- OpenGL Multipipe™: Application-transparent software enables any OpenGL application to benefit from increased display resolution available in multipipe SGI Reality Center environments

Support Services

- Embedded Support Partner (ESP): 7x24 system monitoring, flexible real-time notification, proactive system management for increased availability
- SGI® Supportfolio™: Instant Web access to customer support information
- SGI® Knowledgebase: Online access to thousands of proven support solutions
- Product Support: Mission-Critical Support, SGI® FullExpress™, SGI® FullCare™, HardwareCare, SoftwareCare

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