Chip specifications

General characteristics and key features

- 0.18-micron technology
- 256-bit DualBus graphics chip
- 64-bit Double Data Rate (DDR) external bus to frame buffer memory
  - Up to 32MB frame buffer configurations supported
- Full AGP 4X device with multi-threaded bus mastering
  - Support for AGP 1X, 2X and 4X
- Dual integrated RAMDACs
- Dual integrated TMDS transmitters enabling multi-display output to two digital flat panels
- Integrated TV encoder
- Matrox DualHead® display technology
  - Multiple independent displays with a single AGP card:
    - Analog flat panel (RGB monitor) / analog flat panel (RGB monitor)
    - Analog flat panel (RGB monitor) / TV
    - Analog flat panel (RGB monitor) / digital flat panel
    - Digital flat panel / digital flat panel
    - Digital flat panel / TV
- HeadCasting Engine for Visual Online Communication
  - Extended Vertex Shader* with 256 constant registers
  - DirectX 8.0 Matrix Palette Skinning with up to 32 matrices
  - Supported for HeadCasting applications only
- Dual pixel pipelines with dual texturing units per pixel pipeline
- High quality DVD/video playback with DVDMax
  - Independent full-screen playback on secondary display
- Vibrant Color Quality^2 (VCQ^2) rendering
  - 32-bit internal precision, specially enhanced for multi texturing using 32-bit source textures
- UltraSharp RAMDAC technology
- High-speed integrated primary RAMDAC (up to 360 MHz)
  - Flicker-free display up to 2048 x 1536 @ 32bpp on the primary display
- DirectX Environment-Mapped Bump Mapping
- Bilinear, trilinear and anisotropic filtering
- 32-bit Z-buffer including 8-bit stencil buffer

2D drawing engine

- Benchmark-winning 2D performance
  - World's fastest Windows® acceleration
- UltraSharp RAMDAC technology for highest quality analog output and ultra-sharp text quality
- Optimized for 32bpp, 24bpp, 16bpp, 15bpp and 8bpp
- Full acceleration of GDI and DirectDraw functions including new Windows 2000 GDI features
- Linear frame buffer with support for packed pixels
- Programmable, transparent Bit-Block Transfer (BLTter)
- Hardware cursor with alpha assist
- Linear packed pixel frame buffer
- 32-bit ultra-fast VGA core
- Transparency and color keying

Display engine

- Dual integrated CRTC controllers
  - Drive two independent displays from one graphics chip
- Dual integrated RAMDACs
  - 360 MHz primary and 230 MHz secondary
- Integrated dual TMDS transmitter enabling multi-display output to two digital flat panels
- Integrated TV encoder
  - Support for NTSC, PAL, SECAM
  - Supported at up to 1600 x 1200 desktop resolutions
- Matrox DualHead display technology
  - Multiple independent displays with a single AGP card:
    - Analog flat panel (RGB monitor) / analog flat panel (RGB monitor)
    - Analog flat panel (RGB monitor) / TV
    - Analog flat panel (RGB monitor) / digital flat panel
    - Digital flat panel / digital flat panel
    - Digital flat panel / TV
- Supports up to 2048 x 1536 @ 32bpp on primary RGB monitor or analog flat panel
- Supports up to 1600 x 1200 @ 32bpp on secondary RGB monitor, analog flat panel or TV
- Supports up to 1280 x 1024 @ 32bpp on primary and secondary digital flat panel

Chip specifications

3D engine

- HeadCasting Engine for Visual Online Communication
  - Real-time acceleration of animated photo-realistic faces with lip synchronization
  - Extended Vertex Shader with 256 constant registers
    - Stores all constant data for up to 32 Matrix skinning of a 3D mesh
  - DirectX 8.0 Matrix Palette Skinning with up to 32 matrices
    - Up to 4 independent matrices / vertex
    - Up to 12 independent matrices / triangle
    - Up to 32 independent matrices / draw call
  - Supported for HeadCasting applications only
- Dual pixel pipelines with dual texturing units per pixel pipeline
- Floating point 3D setup engine with dynamically re-allocatable resources:
  - Pipelined floating point and culling engines
  - Optimized support for Direct3D and OpenGL® triangles, strips, fans and vectors
  - Flexible vertex format natively supported
  - Vertex buffers natively supported
- DirectX Environment-Mapped Bump Mapping (EMBM)
- Vibrant Color Quality² (VCQ²) rendering
  - 32-bit precision internal rendering for single and multi-texturing
  - 32-bit source textures
  - 32-bit output
  - Full sub-pixel and sub-texel correction
  - 8-bit precision for filter coefficients
  - Highly saturated & separated analog color output
- Texturing support:
  - Dual texturing units per pixel pipeline
  - Perspective-correct texture mapping
  - Texture sizes up to 2048 x 2048
  - Support for all texture formats
  - Texturing from local and AGP memory
  - Opaque texture surfaces
  - Alpha in texture palettes
  - 11 level mip-mapping support
  - Texture transparency
  - Mip-mapped non-power-of-2 texture support
  - Full subpicture-blended DVD as texture source
- Filtering support:
  - Bilinear filtering
  - 8-sample-per-pixel trilinear filtering
  - Anisotropic filtering
- Alpha blending:
  - DirectX and OpenGL blend modes
  - Supports all permutations of passes including light maps, environment maps, reflection maps, etc.
- Z-buffer support:
  - 16-bit
  - 24-bit plus 8-bit stencil buffer
  - 32-bit
- Full sub-pixel precision
- Specular highlighting (any color)
- Vertex and table fogging
- True color RGB, flat and Gouraud shading
- Environment Mapping
- Guard band clipping
- Single, double or triple buffering
- 3D image effects combined with no exclusion conditions
- Sort independent anti-aliasing
- Hardware dithering including dithering of LUT textures

Chip specifications

Video and multimedia features

- Planar YUV support
- Multiple YUV pixel formats
- Independent front- and back-end scalars
  - Supports overlay modes at high resolution
- Independent X and Y scaling with high-quality 12-tap scaling filter
  - 4-tap horizontal
  - 3-tap vertical
- High-quality DVD, MPEG-2 and video playback with DVDMax
  - Full-screen output to secondary display independent of primary display
  - Non-scaled full-screen output of native format DVD and video to TV
  - Full-hardware subpicture support and blending for high-quality DVD playback
  - Aspect ratio conversion supported for proper display of 4:3 and 16:9 content
  - AGP 4X bus mastering of video data
  - Independent hardware color controls for video overlay
- Hardware color space conversion
- Support for unlimited number of simultaneous video windows and sprites
- Parallelized video input and output port
- Support for HDTV
  - HD playback support of up to 1080i (1920 x 1080)
  - HD0 input support of up to 720p (1280 x 720)
- User-controllable flicker filter, up to 6 lines
- Underscan and overscan capabilities
- Support for picture-in-picture and multiple video windows
- Full WDM support for video capture
- Microsoft® Video Mixing Renderer (VMR) support
- Unique Motion Video Rendering (MVR) architecture
  - Native support for non-power-of-2 textures
  - Facilitates preservation of 16:9 aspect ratio when texture mapping video streams
  - Mip-map non-power-of-2 texture
  - Multiple YUV source texture formats for video stream texture mapping
  - Video editing architecture enables real-time A/B roll capability

Compatibility

- Matrox Unified Drivers
- Operating systems
  - Windows® XP Professional and Home
  - Windows 2000
  - Windows 98, Windows 95 and Windows Me
  - Windows NT® 4.0
  - Linux
- Platforms
  - X86, X86-64 and IA-64™ compatible
  - AMD® 3Dnow!™, MMX™, and Intel SSE™ & SSE2™ optimized
  - AGP 4X, 2X, 1X compliant
- Compliance
  - DirectX 8.0 and lower
  - WinLogo 2.0 & WinLogo 1.1 compliant
  - Microsoft DirectShow and Broadcast PC
  - OpenGL
  - WDM and VMR

* In some Matrox documents, extended vertex shader may also be referred to as extended matrix palette skinning.

Chip information only. All features are not necessarily enabled in board-level products. Please visit the Matrox Web site for more information.

Information under NDA until June 19, 2001.