MAGIC Silicon

SM3110

3D Video Graphics LCD/CRT Accelerator Chip

Features Overview

4 Mbytes of embedded graphics RAM

Bi/Tri-Linear Mip-map 3D Engine
- Advanced Floating Point 3D setup engine
- Z-buffering

3 Op 2D Engine
- 256 ROP on 8, 16, 24 bpp with transparency

Video playback acceleration
- Color and Chroma key
- Bi-linear (X,Y) interpolated scaling
- Color space conversion
- Motion Compensation
- Bob and Weave

Industry standard Video input support
- ZV port, I^2C support

MyView™ dual display support
- Independent LCD and CRT display

LCD panels and CRT support
- TFT up to 1280x1024x24 bpp
- DSTN up to 1280x1024x16bpp
- CRT up to 1600x1200x16 bpp

AGP 2x and 66 MHz PCI 2.2 host interface with bus mastering

SmartPower™ power management system
- Full VESA 2.0 and DPMS support
- 2.5V and 3.3V operation with 5V tolerant I/O

304 pin PBGA package

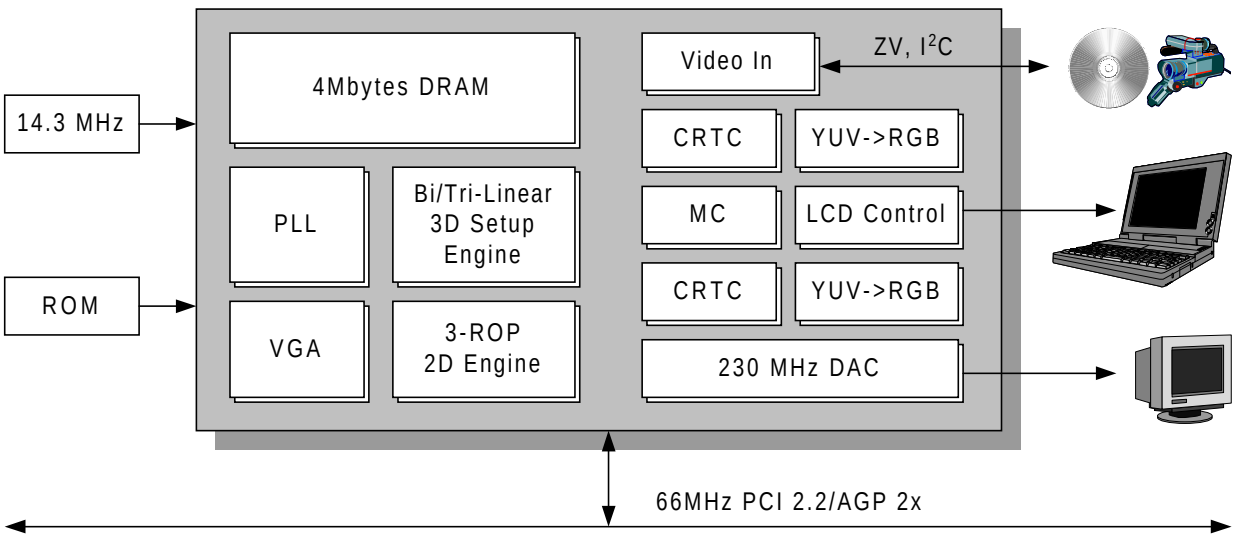
The SM3110 provides an optimal graphics sub-system for notebook computers. Its unique design embeds rich features and superior performance in a *single chip*.

Embedded Performance and $avings

The SM3110 integrates an advanced 3D engine, a robust 3 Op 2D accelerator, hardware video playback acceleration with interpolated scaling, independent dual display channels for LCD and CRT, a true color 230 MHz DAC and 4 Mbytes of embedded DRAM optimized for bandwidth availability and usage.

By integrating the optimal memory and functionality required by popular notebook applications, the SM3110 multimedia solution eliminates two or more external components, while attaining highest possible performance. For notebook computers this all adds up to ease of design and valuable savings in PCB space, weight, and sub-system costs.

Moreover, its SmartPower™ power management system ensures ultra-low power consumption during all operations and adheres to the ACPI goals for 1999 mobile computers which adds significant time to notebook battery life.



4MB Embedded Graphics RAM

3D Engine

- Triangle setup engine
- Bi- andTri-linear MIP mapping
- Alpha and texture blending
- Transparency
- Colored Fog
- Stipple support
- On-chip texture palette
- Supports 16, 24, or 32 bpp
- 1, 2, 4, 8, 16 bit texture map support
- Up to 1 Mbyte command/ parameter buffer

2D Engine

- 256 Raster Operations
- Color Expansion
- Mono/Color Pattern Fill
- Transparent and Opaque Text
- Color Compare for Color Keying/ Transparency Control
- 8, 16, or 24 bpp color
- Frame synchronization
- 32KB data FIFO
- 32KB command FIFO
- 256x256 monochrome or 32x32 color hardware cursor

Video Acceleration

Superior Video playback acceleration

- Hardware destination Color and Chroma key support
- Bi-linear (X,Y) interpolated scaling
- Color space conversion
- Motion Compensation to ensure >30fps during DVD/MPEG2 playback
- Independently scalable hardware windows for each display channel

Industry standard Video input support

- ZV port
- I^2C support
- Glueless interface to video digitizers
- Real-time 720x525 video capture
- On-the-fly horizontal downscaling

Display Output

MyView™ dual display support

- Allows true multitasking by displaying different images on LCD and CRT simultaneously
- Independent resolution and refresh rate for each display for optimal display quality

High resolution support on LCD panels and CRT

- TFT flat panel support up to 1280x1024x24 bpp
- DSTN up to 1280x1024x16bpp
- CRT up to 1600x1200x16 bpp

True color 230MHz palette DAC with gamma correction

- 4, 8, 15, 16, 24, 32 bpp support up to 1600x1200 CRT resolution at 85 Hz
- DDC2 and DDC2B support

DSTN, TFT flat panel support with gamma correction

- One OEM customizable hardware display icon
- 9, 12, 18, 24 bpp TFT LCD panel support with dithering in resolutions up to 1280x1024 at 85Hz
- 8, 16, 24 bit DSTN with dithering and FRC support in resolutions upto 1280x1024 at 85Hz
- 12, 18, 24 and 36 bit panel interface
- Configurable Default Display at Power Up
- Two independent hardware cursors

Digital or Analog TV Encoder Interface

LVDS or TMDS Interface

High-performance AGP interface

- AGP 2.0 interface, 1x & 2x with Sideband addressing
- 32 bit, 66 MHz PCI 2.2 interface
- Memory mapped relocatable registers
- Linear addressable frame buffer
- Bi-endian data format support
- 3.3v host interface with 5V tolerance

SmartPower ™ = longer battery life

- Ultra-low power consumption achieved with dynamic control during all operations
- Comprehensive support for suspend, standby, and hibernation modes
- Full VESA 2.0 DPMS and DDC2B support for GreenPC and CRT plug and play
- 2.5V internal operation, 3.3V I/O with 5V tolerance

Maximum display resolutions supported

Mode	Resolution (w pixels x h pixels) x Color Depth (bits/pixel)	
Single Display	**CRT**	1600 x 1200 x 16
	CRT or TFT	1280 x 1024 x 24
	DSTN	1280 x 1024 x 16
	CRT or LCD	1024 x 768 x 32
Single Display w/NTSC DVD (full-screen)	**CRT or LCD**	640 x 480 x 24
MyView™ Dual Displays	**LCD**	**CRT**
	1280 x 1024 x 16	800 x 600 x 16
	1280 x 1024 x 8	1600 x 1200 x 8
	1024 x 768 x 24	800 x 600 x 24
	1024 x 768 x 16	1024 x 768 x 16
	1024 x 768 x 8	1600 x 1200 x 8
	800 x 600 x 32	800 x 600 x 32

Optimized drivers, BIOS and utilities

The SM3110 is designed to accelerate Microsoft's DirectX architecture including DirectDraw and Direct3D, plus OpenGL in the Windows environment. Optimized drivers and utilities for Windows 95/98, NT 4.0, and Windows 2000 operating systems back the high performance hardware. An ICD driver for OpenGL is also available.

The SM3110 is supported by the industry standard VESA VBE-compliant VGA BIOS to provide optimum performance and functionality in VGA and VESA extended display modes.

The SM3110 is backed by a strong suite of utilities to help with the customization and update of BIOS. A utility to generate and fine tune the timing configuration of LCD panels in the BIOS is also available.

Software Drivers	Resolutions Supported	No. of colors
Microsoft Windows 95, 98, 2000, NT 4.0, Direct3D, OpenGL	640x480, 720x480, 800x600, 1024x768, 1280x1024, 1600x1200	256 or 65536
	640x480, 720x480, 800x600, 1024x768, 1280x1024	16.8 million
Microsoft WDM/VPE/VPM Driver	Resolution-independent	-
DVD Playback	800x600	65536
	640x480	16.8 million

World class OEM support

The SM3110 is backed by a strong team of industry experienced professionals to provide excellent design and manufacturing support.

Our applications team's expertise with hardware and software ensures timely and complete response to all your design issues and problems. OEM reference designs and comprehensive technical documentation is available for quick, trouble-free designs.

Please contact us if you need more information or would like to obtain an evaluation kit.

Contact Info:

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Five dynamite benefits of SM3110

1. The highly integrated SM3110 incorporates 2D, 3D, video, DAC and 4Mbytes of super-fast DRAM. This single chip solution enhances ease of design and saves valuable space on the motherboard by eliminating several chips to help you design smaller and lighter notebooks.

2. The SM3110 offers a rich set of 2D, 3D and video features that enable popular applications for a notebook user at work, at home of while travelling. Its versatile display capabilities allow ultimate user control of display options for highest viewing quality.

3. By integrating what is probably the most critical determinant of graphics performance--graphics memory--the SM3110 attains performance levels comparable to desktop accelerators. Its custom 4 Mbyte memory module, optimized for bandwidth availability and usage, has a peak data throughput rate of 6.4 Gigabytes per second.

4. The SM3110 consumes ultralow power in all operation modes. Its SmartPower™ management dynamically controls various functional blocks to garner substantial savings in power consumption. Integration of memory also helps significantly. The SM3110 consumes significantly less power than any equivalent discrete solution.

5. By combining all the requisite components of a notebooks's graphics system in one chip, the SM3110 provides a cost-effective solution. A lower overall cost of design, due to integration and valuable space and weight savings, adds valuable $$$ to your bottom line.

The SM3110 is truly an optimal blend of features, performance and functionality. It enables smaller, lighter notebooks with longer battery life and desk-top-like multi-media performance.