

## FEATURES

- **64-bit high-bandwidth synchronous DRAM interface**
  - 800 Mbytes/sec. peak memory bandwidth
  - Supports modes up to 1600 × 1200, 64K colors at 60 Hz and 1280 × 1024, 16.8M colors at 75 Hz
  - Provides significant additional memory bandwidth for BitBLT (bit boundary block transfer) and video window operations, even in high-resolution/color-depth graphics and video modes
- **Microsoft® PC97-compliant**
  - Direct access to frame buffer independent of BitBLT
  - Relocated VGA and BitBLT registers
  - Subsystem, subsystem vendor ID
  - Low-resolution modes for Direct3D™
- **Video conferencing advantages**
  - Glueless digital camera interface with direct support of CCIR (ITR-U, International Radio Consultive Committee) 6:5:6 format
  - Dual-hardware video window for local and remote viewing
  - Optional PCI bus master conversion to YUV 4:2:0 for off-loading CPU during local view transmission
  - Remote and local view mirror image and vertical flip options
  - Continuous XY filtered downscaling for video conference display size
- **Intel® Intercast™ support**
  - Luminance-only video capture mode for efficient VBI (vertical blanking interval) data processing
  - Simultaneous capture and transfer of VBI data to system memory while TV picture is displayed in the video window
  - PCI bus master write operation for fast transfer of VBI data to system memory without CPU intervention
- **MPEG playback assist**
  - Playback support for native MPEG format of planar YUV 4:2:0, freeing CPU of conversion burden
- **3 × 8 palette LUT with independent RGB addressing for color adjustment (such as gamma correction) in 15-, 16-, and 24-bpp modes**

## 64-Bit SGRAM GUI Accelerator

## OVERVIEW

The CL-GD5480 is the latest member of the Cirrus Logic Alpine™ family and interfaces to a high-speed SGRAM (synchronous graphics RAM) frame buffer. This device delivers a high-performance combination of graphics, animation, better-than-TV quality full-screen video, and software 3D acceleration in an integrated single-chip device.

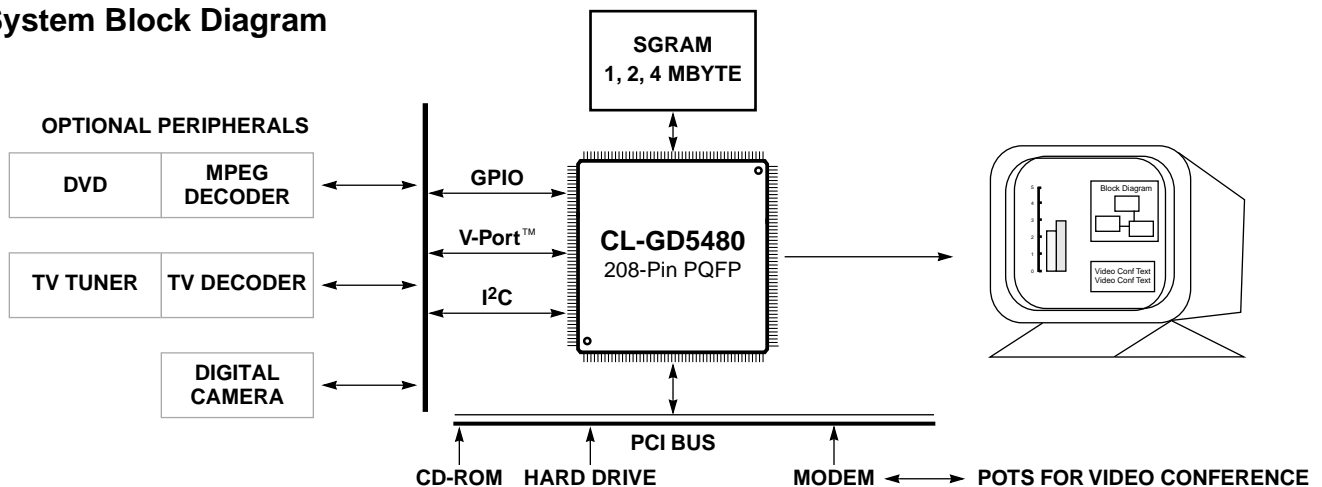
Packaged in a 208-pin PQFP and using the industry-standard V-Port™ to interface directly to various video input devices, the CL-GD5480 offers a highly cost-effective and flexible VisualMedia™ solution.

The V-Port, GPIO, and I²C bus interfaces provide a glueless connection to external devices to play back disk-based video files (including MPEG), and to provide TV-in-a-window, closed captioning, InterCast™, and video conferencing.

The CL-GD5480 has many features designed specifically to optimize Microsoft® DirectDraw™ performance. Hardware support for Microsoft Direct3D™ software also enables a cost-effective 3D visual system.

The CL-GD5480 is software-compatible with the Cirrus Logic Alpine family, featuring the industry's most stable software drivers, most extensive software QA process, and best language localization support. The VPM™ (video port manager) interface, an industry-standard driver API created by Cirrus Logic for Windows® 3.1x and Windows® 95, provides an easy path for V-Port peripheral application software development.

## System Block Diagram



**ADVANTAGES****Outstanding VisualMedia™ Acceleration**

- BitBLT command list in off-screen memory
- 100-MHz synchronous memory (SGRAM) interface
- PCI bus master writes of captured video data streams
- High-performance PCI bus interface
- Full PCI v2.1-compliance
- Vertical scanline readback, display double-buffering support, and transparent BitBLT operations
- Z,C interleave data separation on system-to-screen write

**Superior Video Performance**

- Advanced video playback features with continuous interpolated zoom/shrink, and color/chroma key overlay for all modes
- YUV 4:2:0 display support including 4:2:2-to-4:2:0 capture conversion option
- Second hardware video window support
- Patented multiformat frame buffer with independent memory apertures for BitBLT and CPU/video operations

**Cost-Effective Design and Integration**

- Advanced 0.4-μm CMOS process
- Cirrus Logic–owned manufacturing capacity
- Video capture V-Port™ interface to external video devices
- GPIO and I<sup>2</sup>C interfaces
- Integrated dual synthesizer and filters, oscillator, 200-MHz RAMDAC and current reference

**Compatibility and Ease of System Design**

- Industry's best VisualMedia™ software support
- Compatible with CL-GD5446 software
- Localization support
- Cirrus Logic TVTap™ application software
- VPM™ provider for Windows® 3.1x and Windows® 95
- VMI 1.4-compatible
- Supports ×32 SGRAMs up to 100 MHz
- Compatible with VGA and VESA® standards

**BENEFITS**

- Enhances graphics performance, especially for text.
- Faster screen refresh performance for higher resolutions and monitor refresh rate support.
- Increases performance of video capture-to-system memory transfers for multiple applications, such as video conferencing, Intericast™, and software 3D acceleration.
- Provides ample interface speed margin compared with available and next-generation core logic chipsets.
- Interfaces easily to high-performance core logic chipsets.
- Optimizes display page-flipping support for outstanding games animation performance under DirectDraw™.
- Accelerates software 3D performance.
- Maintains high-quality video over a wide range of sizing options with video and graphics overlay support in all color depths.
- Accelerates MPEG-2 native codec playback and capture.
- Allows display of video conferencing local view.
- Allows concurrent operations and independent graphics/video color depths for efficient memory/bandwidth usage.
- Higher speed and performance margin with low-power operation.
- Full control and access to advanced manufacturing processes.
- Eliminates the need for a separate video frame buffer, lowering overall system cost.
- Provides a low-cost control interface for applications such as TV tuners, DVD (digital video disk) drives, and digital cameras.
- Lower overall system implementation cost.
- Extensive QA process and maintenance program ensures high quality and maximum customer satisfaction.
- Based on production-proven, high-quality software.
- Complete utility localization for 21 languages.
- TV decoder software for CL-GD5480 interface with the most popular video decoders and tuners.
- Eases peripheral-application software development.
- Easy connection to external video devices.
- Allows multiple memory configurations and vendors.
- Compatible with installed base of systems and software.

## SOFTWARE SUPPORT

### DRIVERS

- Microsoft® Windows® 95
- Microsoft® Windows® NT™ 3.51, 4.0
- Microsoft® Windows® 3.1x
- OS/2® v2.1, v2.11, v3.0
- AutoCAD® v12.0, v13.0
- MicroStation
- UNIX® (Solaris, SCO, Unixware)
- VPM provider under Windows® 3.1x and Windows® 95

### UTILITIES

- Graphics and video diagnostics test
- Windows® NT™ and DOS utilities
- Display mode configuration utility — CLMODE
- Set resolution in Windows® utility — WINMODE
- Configurable system integration for OEMs — OEMSI
- DMI (desktop management interface) support
- Gamma correction user interface
- EZREZ: Windows® 3.1 resolution/color depth change on-the-fly
- Windows® 95 refresh rate/resolution/color depth change utility

### BIOS SUPPORT

- IBM® VGA-compatible BIOS
- 32 Kbytes with PCI bus support
- Adapter or motherboard implementation
- VBE™ 2.0 (VESA® BIOS extensions) support in ROM
- Support for DPMS (display power management signaling) in ROM
- VESA® monitor timing-compliant
- DDC2B support

### LOCALIZATION

- |                       |                          |
|-----------------------|--------------------------|
| ■ Simplified Chinese  | ■ Korean                 |
| ■ Traditional Chinese | ■ Norwegian              |
| ■ Czech               | ■ Polish                 |
| ■ Danish              | ■ Brazilian Portuguese   |
| ■ Dutch               | ■ Portuguese             |
| ■ Finnish             | ■ Russian                |
| ■ French              | ■ Latin American Spanish |
| ■ German              | ■ Spanish                |
| ■ Hungarian           | ■ Swedish                |
| ■ Italian             | ■ Thai                   |
| ■ Japanese            |                          |

## CL-GD5480 Extended Display Modes and Refresh Rates (Hz)

Resolution	16 Colors	256 Colors	32K/64K Colors	16.8M Colors
640 × 400	–	70	–	–
640 × 480	60 (standard VGA)	60, 72, 75, 85, 100		
800 × 600	56, 60, 72, 75	56, 60, 72, 75, 85, 100		
1024 × 768	43i <sup>a</sup> , 60, 70, 75	43i, 60, 70, 75, 85, 100		43i, 60, 70, 75, 85
1152 × 864	–	70, 75, 85, 100	70, 75, 85	70, 75
1280 × 1024	43i	43i, 60, 75, 85		43i, 60
1600 × 1200	–	48i, 60		–

<sup>a</sup> 'i' indicates interlaced.

## APPLICATIONS SUPPORT

- Technical reference manual and design kit — complete data book, electrical specifications, register set definitions, pin descriptions, reference designs, and applications information.
- BIOS and driver release kits — contains user guides, PDR (problem description report) forms, source code license agreement, and quality assurance procedures.
- PCI board evaluation kit — adapter card including CL-GD5480, on-board BIOS, and 2-Mbyte SGRAM shipped with complete design package (schematics, Gerber® files) and software drivers.
- Electronic information services:
  - ftp: ftp.cirrus.com
  - World Wide Web: <http://www.cirrus.com>
  - BBS: (510) 440-9080
  - Fax-on-demand: (510) 249-4200

## Direct Sales Offices

### Domestic

#### N. CALIFORNIA

Fremont  
TEL: 510/623-8300  
FAX: 510/252-6020

#### S. CALIFORNIA

Irvine  
TEL: 714/453-5961  
FAX: 714/453-5962

Westlake Village  
TEL: 805/371-5860  
FAX: 805/371-5861

#### SOUTH CENTRAL AREA

Austin, TX  
TEL: 512/255-0080  
FAX: 512/255-0733

Dallas, TX  
TEL: 214/252-6698  
FAX: 214/252-5681

Houston, TX  
TEL: 281/257-2525  
FAX: 281/257-2555

#### NORTHEASTERN AREA

Andover, MA  
TEL: 508/474-9300  
FAX: 508/474-9149

#### SOUTHEASTERN AREA

Duluth, GA  
TEL: 770/935-6110  
FAX: 770/935-6112

Raleigh, NC  
TEL: 919/859-5210  
FAX: 919/859-5334

Boca Raton, FL  
TEL: 407/241-2364  
FAX: 407/241-7990

### International

#### FRANCE

Paris  
TEL: 33/1-48-12-2812  
FAX: 33/1-48-12-2810

#### GERMANY

Munich  
TEL: 49/81-52-40084  
FAX: 49/81-52-40077

#### HONG KONG

Tsimshatsui  
TEL: 852/2376-0801  
FAX: 852/2375-1202

#### ITALY

Milan  
TEL: 39/2-3360-5458  
FAX: 39/2-3360-5426

#### JAPAN

Tokyo  
TEL: 81/3-3340-9111  
FAX: 81/3-3340-9120

#### KOREA

Seoul  
TEL: 82/2-565-8561  
FAX: 82/2-565-8565

#### SINGAPORE

TEL: 65/743-4111  
FAX: 65/742-4111

#### TAIWAN

Taipei  
TEL: 886/2-718-4533  
FAX: 886/2-718-4526

#### UNITED KINGDOM

London, England  
TEL: 44/1727-872424  
FAX: 44/1727-875919

## The Company

Headquartered in Fremont, California, Cirrus Logic is a leading manufacturer of advanced integrated circuits for desktop and portable computing, telecommunications, and consumer electronics. The Company applies its system-level expertise in analog and digital design to innovate highly integrated, software-rich solutions.

Cirrus Logic has developed a broad portfolio of products and technologies for applications spanning multimedia, graphics, communications, system logic, mass storage, and data acquisition.

The Cirrus Logic formula combines innovative architectures in silicon with system design expertise. We deliver complete solutions — chips, software, evaluation boards, and manufacturing kits — on-time, to help you win in the marketplace.

Cirrus Logic's manufacturing strategy ensures maximum product quality, availability, and value for our customers.

Talk to our systems and applications specialists; see how you can benefit from a new kind of semiconductor company.

Copyright © 1996 Cirrus Logic Inc. All rights reserved.

*Advance* product information describes products that are in development and subject to developmental changes. Cirrus Logic Inc. has made best efforts to ensure that the information contained in this document is accurate and reliable. However, the information is subject to change without notice. No responsibility is assumed by Cirrus Logic Inc. for the use of this information, nor for infringements of patents or other rights of third parties. This document implies no license under patents, copyrights, or trade secrets. Cirrus Logic, AccuPak, DIVA, FastPath, FasText, FeatureChips, Good Data, Laguna, Laguna3D, MediaDAC, MotionVideo, SimulSCAN, S/LA, SMASH, SofTarget, TextureJet, TVTap, UXART, VisualMedia, V-Port, Voyager, WavePort, and WebSet are trademarks of Cirrus Logic Inc., which may be registered in some jurisdictions. Other trademarks in this document belong to their respective companies. CRUS and Cirrus Logic International, Ltd. are trade names of Cirrus Logic Inc.