Silicon Image™
VastLane

SiI1392

- **Media Center PCs**
- **Desktop PC Motherboards**
- **Notebook PCs**
- **Add In Boards**

VastLane™ HDMI Transmitter

High-definition video and audio solution for PC motherboards

Silicon Image's SiI1392 VastLane transmitter interfaces seamlessly to a variety of PC graphics sources to support DVI and HDMI™ displays with resolutions up to UXGA or 1080p. The built-in High-bandwidth Digital Content Protection (HDCP) engine secures the digital link for transmission of valuable HD video and audio. These transmitters are prepro-grammed with unique HDCP keys, providing state-of-the-art security while reducing man-ufacturing complexity and cost.

Key Features

- **Compatible with HDMI 1.2 specification**
- **Supports 1080p resolution at 60Hz**
- **Built-in HDCP encryption engine**
- **SVDO 1.21**
- **Flexible Audio Input: HD Audio or S/PDIF**

The SiI1392 VastLane transmitter provides 25-165 MHz HDMI and DVI HDCP output respectively. It accepts the full operating range of Serial Digital Video Output (SDVO) on the input port with a robust, high jitter-tolerance imple-mentation that exceeds the requirements of the Intel SDVO 1.21 specification. The SiI1392 sup-ports a variety of audio interfaces including S/PDIF and Intel HD-Audio interface to enable broad audio compatibility. When using the high-resolution HD-Audio port, this chip is capable of supporting the DVD audio standard and other digital audio formats consisting of up to eight channels at 192 kHz.

This latest family of VastLane transmitters brings a comprehensive suite of solutions to enable PC platforms to offer new levels of multimedia per-formance with access to premium HD video and audio content. Each product is compliant with HDCP 1.2 and supports repeaters by implement-ing on-chip Secure Hash Algorithm (SHA-1) logic and provides convenient and secure on-chip, pre-programmed HDCP keys. Applications that require even more performance can utilize the SiI1392CNU-3, which offers blazing-fast per-formance of up to 340 MHz or 10.2 Gbps. The SiI1392-3 supports high resolution displays including 1440p and WQXGA.
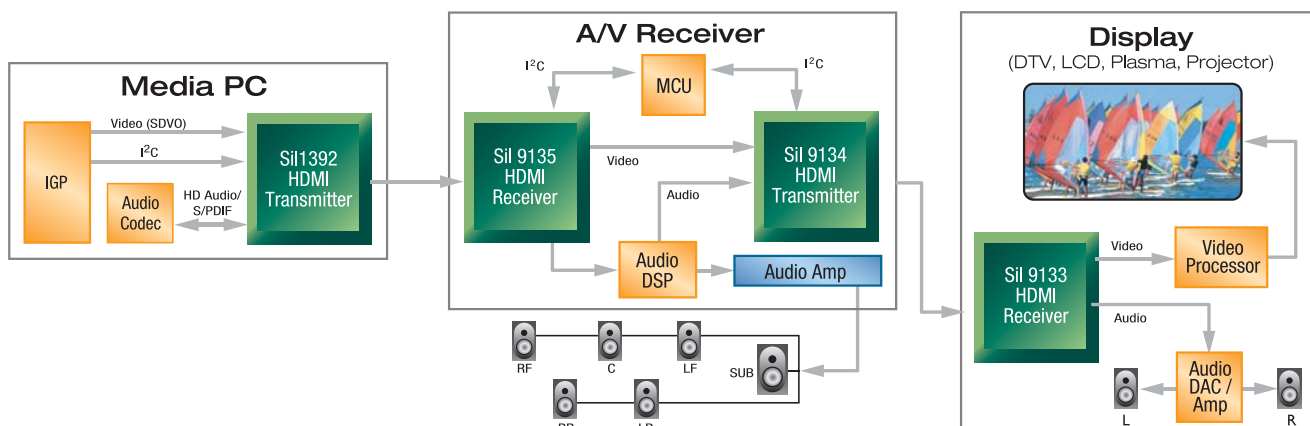
HDMI™
HIGH-DEFINITION MULTIMEDIA INTERFACE

SiI1392 System Diagram

SiI 1392 Features

SiI1392 Starter Kit
(CP1392HDMI)

Contents include:

Hardware

- SiI1392 ADD2 card
- For desktop PC mother-boards with integrated graphics chipset supporting SDVO and available x16 PCI Express slot

Documentation

- User's Guide
- Schematics
- Bill of Materials (BOM)

Industry-Standard Compliance

- DVI 1.0
- HDMI 1.2
- EIA/CEA-861B
- HDCP 1.2
- SDVO 1.2

Digital Video Inputs

- SDVO (1-2 GHz)

Digital Video Outputs

- Integrated VastLane core supporting cables over 10 meters
- HDMI output:
    - 25-165 MHz - SiI1392CNU
    - 25-340 MHz - SiI1392CNU-3
- Supports DTV (480i -1080p) and PC (VGA-UXGA) resolutions
- Integrated RGB <—> YCbCr color space conversion
- 4:4:4 <—> 4:2:2 converter

Digital Audio

- Supports 8 channels at 192 kHz (including DVD-Audio) through HD-Audio input
- Supports IEC60958 2-channel PCM or IEC61937 compressed audio (Dolby® Digital, DTS, etc.)
- Industry-standard HD-Audio, S/PDIF inputs

Content Protection

- Integrated HDCP cipher engine
- HDCP repeater function support with on-chip SHA-1 logic for high security
- Pre-programmed HDCP keys
  - Simplify manufacturing process
  - Most secure solution available
  - Lower system, manufacturing costs
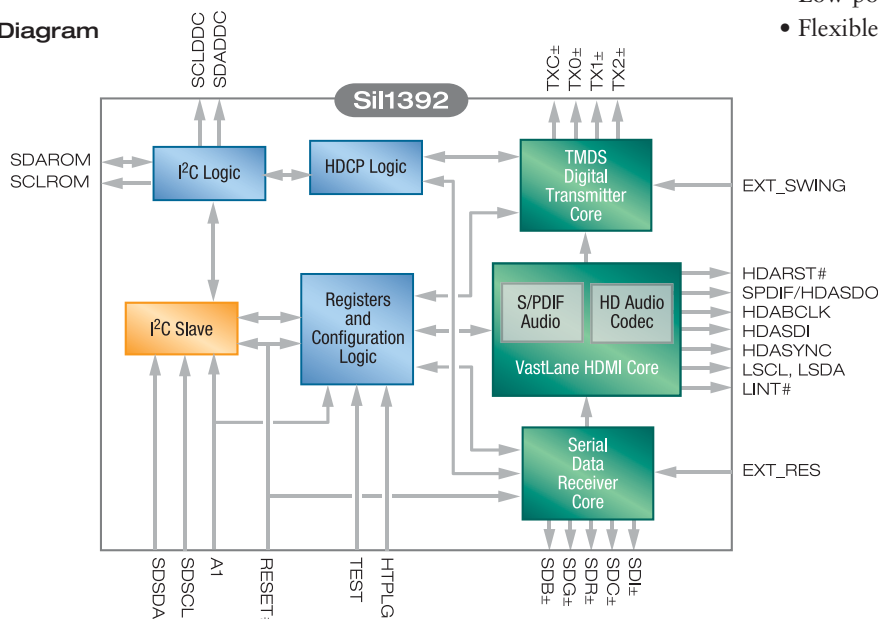- Encrypts both video and audio

System Operation

- Advanced technology for synchronizing video and audio streams without requiring direct communication between graphics and audio drivers
- Optional external microcontroller support for future enhancements
- 64-pin QFN package
- Dual I^2C pass-through interfaces for host I^2C access of EDID via DDC and configuration EEPROM using SDVO
- Flexible interrupt registers with interrupt pin
- Monitor-detection support through hot plug and optional receiver detection

Power Management

- Low-power 1.8V core operation
- Low-power standby mode
- Flexible power-down modes

SiI1392 Circuit Diagram

Silicon Image, Inc.

1060 E. Arques Avenue
Sunnyvale, CA 94085

T 408.616.4000
F 408.830.9530
      www.siliconimage.com

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