Silicon Image™
PinnaClear

SiI 9153

Applications

• **LCD-TV**

• **Plasma display**

• **Front and rear pro-jection DTV**
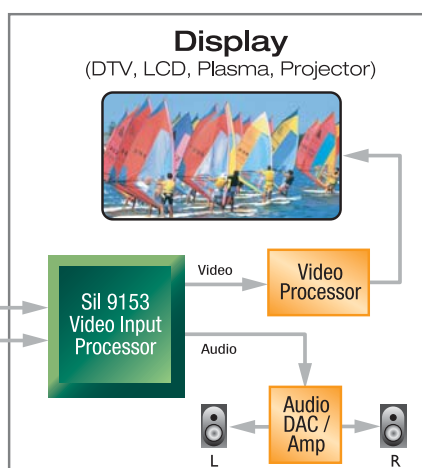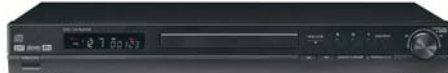
Key Features

• **Two HDMI 1.3 input ports**

• **Two component video or RGB input ports**

• **Supports up to 36-bit color depth at 1080p/60Hz resolutions**

• **2-channel digital audio up to 192KHz**

• **Built-in HDCP decryption engine**

PinnaClear™ HDMI Input Processor

Input Processor with HDMI 1.3 and Component Analog Input Support

Silicon Image introduces the first high-performance HDMI1.3 Input Processor in the PinnaClear product family. As a market leader in HDMI semiconductor solutions, Silicon Image continues to develop leading-edge HDMI 1.3 solutions with integrated HD analog input support. SiI9153 input processor delivers high quality video with billions of colors and digital audio while significantly reducing the bill of materials for DTV manufacturers with integrated analog component input support.

The new PinnaClear SiI9153 video input processor is optimized for mid-range, high-volume HDTVs and brings advanced HDMI 1.3 functionality to mainstream products. The SiI9153 features two HDMI 1.3 inputs paired with two analog high-definition component video inputs to support YCbCr and RGB formats.

The HDMI 1.3 input ports support Deep Color with 12 bits of video at 1080p resolution at 60Hz or 1080i resolution at 120Hz.

The component inputs support high-definition analog video from 480i to 1080i video resolution or RGB inputs up to SXGA resolution. SiI9153 analog ports feature two triple 10-bit ADCs with internal voltage reference, digital phase-locked loop (PLL), clamping circuit and

variable gain control. In addition, the SiI9153 supports two 12-bit digital ITU656 (BT.656) ports or a single 24-bit ITU656 port for high-definition video input with up to 1080p resolution.

The SiI9153 receiver also supports 2-channel stereo digital audio at 192kHz.

The built-in High-bandwidth Digital Content Protection (HDCP) decryption engine secures the digital link for transmission of valuable high-definition video and audio. Each PinnaClear SiI9153 is pre-programmed with unique HDCP keys, providing an extremely high level of security while reducing manufacturing complexity and cost.

HDMI™
HIGH-DEFINITION MULTIMEDIA INTERFACE

SiI 9153 System Diagram

Up to 2 Analog Sources
(Set Top Box, PC, DVD, Game Console, etc.)

Up to 2 HDMI Sources
(HD DVD, Blu-ray, Game Console, etc.)

Display
(DTV, LCD, Plasma, Projector)

SiI 9153 Video Input Processor

Video Processor

Audio DAC / Amp

Video

Audio

L R

SiL9153 Features

SiL9153 Starter Kit
(CP9153HDMI)

Contents include:

Hardware
- SiL9153 receiver daughter board
- HDMI to HDMI cable

Software
- HDMIGear receiver software tool

Documentation
- User's guide
- Schematics
- Bill of materials (BOM)

HDMI
HIGH-DEFINITION MULTIMEDIA INTERFACE™

Industry-Standard Compliance

- HDMI 1.3
- DVI 1.0
- EIA/CEA-861D
- HDCP 1.1
- ITU-656

Digital Video Input/Output

- Dual integrated HDMI 1.3 cores
- Supports DTV resolutions up to 1080p @ 60Hz or 720p/1080i @ 120Hz with 36-bit color depth
- Flexible digital video interface:
  - 24/30/36-bit RGB/YCbCr 4:4:4
  - 16/20/24-bit YCbCr 4:2:2
  - 8/10/12-bit YCbCr 4:2:2 (ITU-R BT.656)
  - 12-bit digital media interface
- Integrated RGB to YCbCr color space conversion with 12-bit accuracy
- 4:2:2 to 4:4:4 converter with 12-bit accuracy
- Dual 12-bit ITU.656 inputs or single 24-bit 4:2:2 input
- 30-bit high-speed digital input mode is available

Analog Video Input

- Dual triple 10-bit ADCs
- 110 MSPS conversion rate
- 1.4 Vp-p analog input range
- Supports RGB and component (YPbPr) video signals
- SD/HD TV formats: 480i/p, 576i/p, 720p, 1080i
- Programmable digital PLL
- Supports sync on green, sync on yellow and separate sync types
- Supports auto gain control and auto clock phase detection
- Supports auto detection of common video standards
- VBI data slicer
- Macrovision (Level 1) detection and handling

System Operation

- Register-programmable via slave I^{2}C interface
- Auto video mode simplifies design
- Auto audio mode allows more robust system
- Flexible interrupt registers with interrupt pin

Digital Audio Output

- Industry-standard S/PDIF and I^{2}C output
- Supports high-end audio including SACD and DVD-Audio: 2-channel at 32-192kHz
- Programmable I^{2}S output supports numerous low-cost audio DACs
- Supports IEC60958 2-channel PCM
- Capable of receiving IEC61937 compressed audio (Dolby® Digital, DTS, etc.)

Content Protection

- Integrated HDCP cipher engine
- Built-in HDCP BIST
- Pre-programmed HDCP keys:
  - Simplify manufacturing process
  - Provide extremely secure solution
  - Lower system, manufacturing costs
- Built-in HDCP self-test

Power Management

- 1.8V core provides low-power operation
- Flexible power-down modes

Silicon Image™

Silicon Image, Inc.

1060 E. Arques Avenue
Sunnyvale, CA 94085

T 408.616.4000
F 408.830.9530
www.siliconimage.com

Simply Stored. Connected. Beautiful.