Silicon Image™
PinnaClear

SiI 9127

PinnaClear™ HDMI Receiver

Two-port HDMI 1.3 Compatible Receiver

The PinnaClear SiI9127 is a two-port HDMI receiver that delivers advanced HDMI 1.3 HDTV features including 1080p Deep Color and x.v.Color expanded color gamut. The SiI9127 offers a cost-effective HDMI 1.3 solution with low standby power plus integrated CEC and EDID support.

The SiI9127 supports up to 36-bit color depth at 1080p/60Hz, 720p/120Hz and 1080i/120Hz resolutions and supports x.v.Color, which increases the number of colors by 1.8 times the RGB color space. The SiI9223 receiver also includes a receiver programming interface that significantly reduces the software overhead required to control the receivers.

The SiI9127 integrates extended display identification data (EDID), which is stored in embedded non-volatile memory (NVM) and loaded during power-up or initialization into two separate EDID RAMs. The two embedded EDIDs simplify the architecture, help reduce BOM cost and save board space.

Integrated consumer electronics control (CEC) hardware and API help reduce BOM cost and development time. The CEC I/O meets HDMI compliance tests and eliminates the need for additional external components. The CEC API manages reception and transmission of all CEC signals and significantly lowers system-level control by the system microcontroller, simplifying firmware overhead.

The SiI9127 consumes a minimal amount of power when in standby mode, with both CEC and EDID remaining fully operational. The standby power plane is isolated and can be powered locally from standby auxiliary power or one of the +5V signals from the HDMI cable. Additionally, only the +5V power from the source device is needed to read the EDID and the display can be completely unplugged from the AC power outlet.

The SiI9127 comes pre-programmed with HDCP keys. This set of keys simplifies the manufacturing process and lowers costs, while providing the highest level of HDCP key security.

The SiI9127 uses the latest generation of TMDS core technology, supporting dynamic cable equalization that will auto-detect the appropriate equalization required for the incoming signal, offering the best support for long cable connections. Silicon Image TMDS cores pass all HDMI compliance tests.

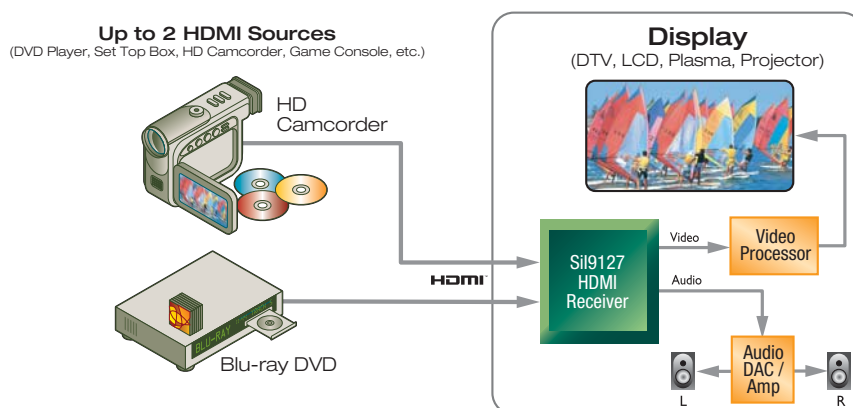## Applications

- **LCD HDTV**
- **Plasma HDTV**
- **Front and rear projection HDTV**

Key Features

- **Two HDMI 1.3 inputs**
- **Supports up to 36-bit color depth at 1080p/60Hz**
- **Built-in Consumer Electronics Control with CEC – API**
- **Two integrated EDIDs**

HDMI™
HIGH-DEFINITION MULTIMEDIA INTERFACE

SiI9127 System Diagram

Up to 2 HDMI Sources
(DVD Player, Set Top Box, HD Camcorder, Game Console, etc.)

HD Camcorder

Blu-ray DVD

Display
(DTV, LCD, Plasma, Projector)

SiI9127 HDMI Receiver

Video — Video Processor

Audio — Audio DAC / Amp

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SiI9127 Starter Kit
(CP9127HDMI)

Contents include:

Hardware
- SiI9127 HDMI 1.3 receiver daughter board
- SiI9134 HDMI 1.3 transmitter daughter board
- Motherboard
- HDMI to HDMI cable
- AC power supply

Software
- Windows debug software tool

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

HDMI™
HIGH-DEFINITION MULTIMEDIA INTERFACE

Industry-Standard Compliance
- HDMI 1.3
- EIA/CEA-861D
- DVI 1.0
- HDCP 1.1

Digital Video Input/Output
- Two HDMI 1.3 ports
- 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)
- Integrated x.v.Color and RGB color space converter for both RGB-to-YCbCr and YCbCr-to-RGB (both 601 and 709) with true 12-bit accurate data using 14-bit processing
- 4:2:2 to 4:4:4 converter with 12-bit accurate data using 14-bit processing

Digital Audio Input/Output
- I^2S audio output with one data signal for stereo formats
- S/PDIF output supports PCM, Dolby Digital, DTS digital audio transmission (32-192 kHz Fs sample rate)
- IEC60958 or IEC61937 compatible
- Flexible, programmable I2S channel mapping
- 2:1 and 4:1 down-sampling to handle 96 kHz and 192 kHz audio streams.
- Intelligent audio mute capabilities avoids pops and noise
- Automatic soft mute and soft un-mute

HDCP
- Integrated HDCP decryption engine for receiving protected audio and video content:
- Pre-programmed HDCP keys provide highest level of security and simplify manufacturing
- Built in HDCP BIST

HDMI Receiver Programming Interface
- Minimal software overhead to control device
- Automatic Video and Audio Control
- Automatic mute and un-mute of audio
- Default values can be loaded from NVM after reset to operate without microcontroller

Built-in Consumer Electronics Control
- HDMI-compliant CEC I/O simplifies design and lowers cost
- Integrated CEC Programming Interface (CPI) lowers software overhead
- Automatic Feature Abort response for unsupported commands
- Automatic message retry on transmit
- Integrated EDID in non-volatile memory
- Optional registers to override EDIDs

Power Management
- Flexible power management
- Separate Standby power pin
- Standby power can be obtained locally or from HDMI +5V signal
- Extremely low standby power

Package
- 20mm x 20mm 128-pin TQFP with ePad

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