

HDMI® 1.4 Receiver

Four-port HDMI Receiver featuring 3D over HDMI, Deep Color, HD Lossless Audio and HDCP Repeater

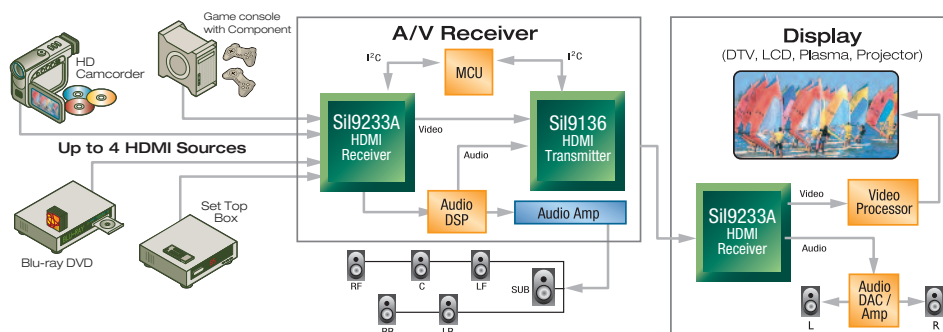
The SiI9233A HDMI 1.4 receiver delivers advanced features such as 3D over HDMI, 1080p Deep Color, HD lossless audio and x.v.Color expanded color gamut to high-definition A/V Receivers. The SiI9233A enables a visually rich and transformative viewing experience with 3D cinema and games along with robust audio features.

The SiI9233A supports up to 36-bit color depth at 1080p/60Hz and x.v.Color that allows for the display of roughly 1.8 times the color range allowed by present industry standards. The SiI9233A supports HD lossless audio, enabling A/V receivers to decode next generation compressed lossless audio formats such as Dolby® True HD and DTS-HD™. Super Audio CD, DVD Audio and multi-channel audio at 192kHz and stereo audio are also supported. The SiI9233A supports 3D over HDMI formats included in the HDMI 1.4 specification.

The SiI9233A includes a receiver programming interface that significantly reduces the software overhead required to control the receiver. The SiI9233A integrates non-volatile memory based extended display identification data (EDID) that is loaded during power-up or initialization into four separate EDID RAMs. The embedded EDIDs simplify the architecture, reduce BOM cost and save PCB real-estate.

The SiI9233A integrated HDMI compliant Consumer Electronics Control (CEC) hardware

SiI9233A Typical Application



and API help reduce BOM cost and development time. The CEC I/O eliminates the need for additional external components and the CEC API manages communication of all CEC commands and signalling, significantly lowering system-level control by the system microcontroller and simplifying firmware overhead.

The SiI9233A supports power down modes. Separate power islands for the CEC and EDID allow these features to be fully operational during power down. The SiI9233A built-in HDCP decryption engine and pre-programmed HDCP keys secures the digital link for transmission of protected high-definition content and reduces manufacturing complexity and cost. The SiI9233A supports full HDCP repeater functionality.

The SiI9233A uses Silicon Image's TMDs core supporting dynamic cable equalization that auto-detects and applies appropriate equalization to provide the best-in-class support for long cable lengths.

SiI9233A

Applications

- A/V receivers
- Wireless media boxes & adapters

Key Features

- Four HDMI 1.4 inputs
- 3D over HDMI
- 36-bit Deep Color at 1080p/60Hz
- Supports Dolby TrueHD & DTS-HD high-bit-rate lossless audio formats
- Full HDCP repeater
- Built-in consumer electronics control with CEC - API
- Four EDIDs for the four HDMI ports



HIGH-DEFINITION MULTIMEDIA INTERFACE

Sil9233A Features

Sil9233A Starter Kit (CP9233A)

Contents include:

Hardware

- Sil9233A HDMI 1.4 receiver daughter board
- Sil9134 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)

Industry-Standard Compliance

- HDMI 1.4
- DVI 1.0
- EIA/CEA-861D
- HDCP 1.1

Package

- 20mm x 20mm 144-pin TQFP with ePad

Digital Video Input/Output

- Four HDMI 1.4 ports with 3D over HDMI
- 3D video formats on all ports:
 - Frame Packing Structure
 - 1080p @ 24 Hz
 - 1080i @ 50/60 Hz
 - 720p @ 50/60 Hz
- Supports video 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 accuracy using 14-bit processing

- 4:2:2 to 4:4:4 converter with 12-bit accuracy using 14-bit processing

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



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