



## SiI 1390/1930/1368 PanelLink/HDCP Transmitters



### Applications

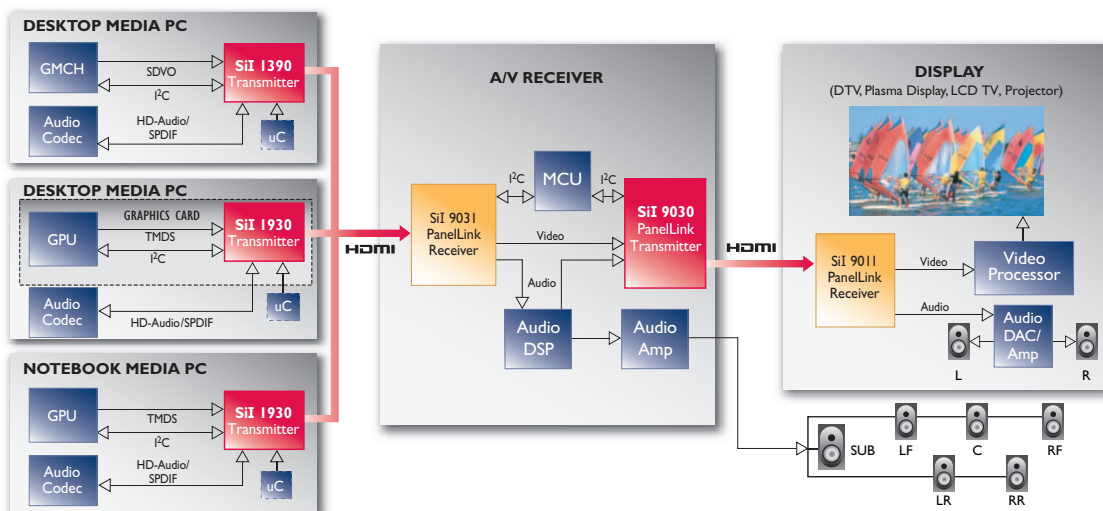
- Media Center PCs
- Desktop PC Motherboards
- Add-In Graphics Cards
- ADD2 Expansion Cards
- Notebook PCs

Silicon Image introduces a new series of PanelLink® transmitters that bring advanced multimedia functionality to PC products. Leveraging PanelLink technology, these transmitters interface seamlessly to a variety of PC graphics sources to support DVI and HDMI™ displays with resolutions up to UXGA or 1080p. Built into the transmitters, the High-bandwidth Digital Content Protection (HDCP) engine secures the digital link for transmission of valuable HD video and even audio when used with the SiI 1390™ and SiI 1930™'s HDMI output. These transmitters are preprogrammed with unique HDCP keys, providing the highest level of security while reducing manufacturing complexity and cost.

The new SiI 1390 and SiI 1368™ transmitters provide a fully compliant 25-165 MHz HDMI and DVI HDCP output respectively. Each product accepts the full operating range of SDVO (1-2 GHz) on the input port with a robust, highly jitter-tolerant implementation exceeding the requirements of the Intel SDVO 1.0 specification. As an HDMI transmitter, the SiI 1390 supports a variety of audio interfaces including I<sup>2</sup>S, S/PDIF, or the Intel HD-Audio interface to enable broad hardware 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 8 channels at 192 kHz. To improve manufacturers' time-to-market, the SiI 1390 and SiI 1368 are pin-compatible with the previous generation SiI 1364 DVI transmitter in a 64-pin TQFP package with EPad.

The SiI 1930 transmitter is designed to generate a fully compliant 25-165 MHz HDMI output. The SiI 1930 interfaces to a variety of industry-leading GPUs with integrated TMDS® transmitters by accepting a TMDS input. The SiI 1930 also has a variety of audio interface ports (I<sup>2</sup>S, S/PDIF, or HD-Audio), and can support the DVD Audio standard and other digital audio formats consisting of up to 8 channels at 192 kHz when using the HD-Audio port.

This latest family of PanelLink transmitters brings a comprehensive suite of solutions to enable PC platforms to offer new levels of multimedia performance with access to premium HD video and audio content. Each product is HDCP 1.1-compliant and supports repeaters by implementing on-chip Secure Hash Algorithm (SHA-1) logic and provides convenient and secure on-chip, preprogrammed HDCP keys.



# PanelLink®

## SiI 1390/1930/1368 Features

### PanelLink/HDCP Transmitters

#### Industry-Standard Compliance

- DVI 1.0
- HDMI 1.1 (Sil 1390/1930)
- EIA/CEA-861B
- HDCP 1.1
- SDVO 1.0 (Sil 1368/1390)

#### Digital Video Inputs

Part	Video Input
Sil 1390	SDVO (1-2 GHz)
Sil 1930	TMDS (0.25-1.65 GHz)
Sil 1368	SDVO (1-2 GHz)

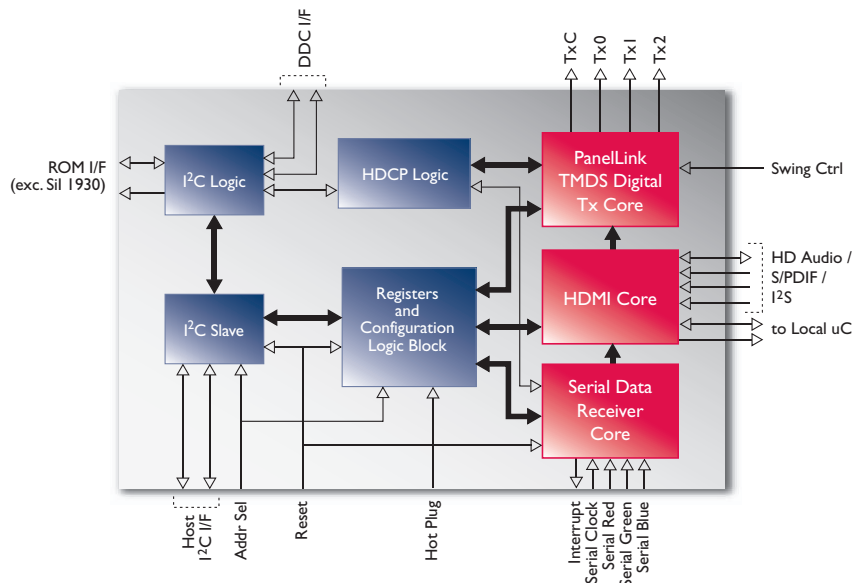
*(For applications requiring a DVO input, please contact your Silicon Image sales representative for further information)*

#### Digital Video Outputs

- Integrated PanelLink core supporting cables over 10 meters
- **Sil 1390/1930:**
  - 25-165 MHz HDMI output
  - Supports DTV (480i-1080p) and PC (VGA-UXGA) resolutions
- **Sil 1368**
  - 25-165 MHz DVI HDCP output
  - Supports DTV (480p-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 or 3xI<sup>2</sup>S 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
  - Sil 1368: video encryption only
  - Sil 1390/1930: video and audio encryption available

#### System Operation

- Advanced technology for synchronizing video and audio streams without requiring direct communication between graphics and audio drivers
- Separate I<sup>2</sup>C slave interface for direct microcontroller access to internal registers
- Dual I<sup>2</sup>C pass-through interfaces for host I<sup>2</sup>C access of EDID (via DDC) and configuration EEPROM (for Sil 1368/1390 using SDVO)
- Flexible interrupt registers with interrupt pin
- Monitor-detection support through hot plug and receiver detection

#### Power Management

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

#### Sil 1390 Starter Kit (CP1390HDMI)

- Sil 1390 ADD2 card
  - For desktop PC motherboards with integrated graphics chipset supporting SDVO and available x16 PCI Express slot
  - Requires available S/PDIF or HD-Audio interconnection from motherboard or sound card
- User's Guide
- Schematics
- Bill of Materials (BOM)

#### Sil 1930 Starter Kit (CP1930HDMI)

- Sil 1930 add-in graphics card adapter
  - For graphics card with DVI connector output
  - Requires available S/PDIF or HD-Audio interconnection from motherboard or sound card
- User's Guide
- Schematics
- Bill of Materials (BOM)

#### Sil 1368 Starter Kit (CP1368DVI)

- Sil 1368 ADD2 card
  - For desktop PC motherboards with integrated graphics chipset supporting SDVO and available x16 PCI Express slot
- User's Guide
- Schematics
- Bill of Materials (BOM)

**Part Number - Sil 1390CTU: SDVO input, HDMI output**  
**Sil 1930CTU: TMDS input, HDMI output**  
**Sil 1368CTU: SDVO input, DVI HDCP output**

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