

### CoolHD™ - Ultra Low Power Transmitter IP Core

#### With HDMI 1.2 Technology

Analogix offers its silicon-proven ultra-low power CoolHD™ transmitter IP Core (digital plus analog PHY) for integration into customers' system-on-chip products in portable applications such as media players, camcorders and digital still cameras. With the proprietary circuit technique, the IP core uses less than 95% of the power used by similar products. At the pixel rate of 720p/1080i, Analogix HDMI Tx IP core uses less than 5mW while similar products consume as high as 70mW.

The CoolHD™ transmitter IP Core provides full support for HDCP encryption and authentication in compliance with the HDCP 1.2 specifications. It also supports Built-In Self Test (BIST) function using a HDA built-in video pattern generator and audio tone generator.

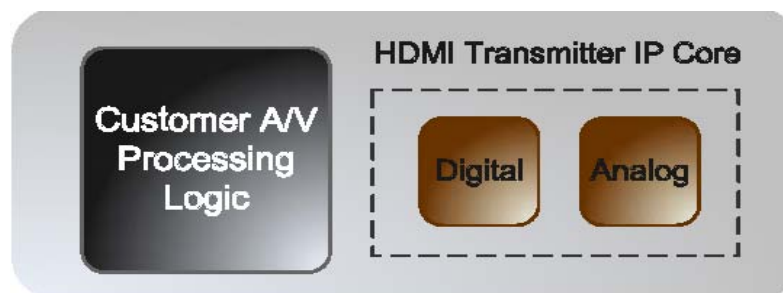
#### Applications

- LCD/DLP/Plasma TVs
- HDTVs
- High-End CRT TVs
- Deep Color Display
- A/V Receivers
- Projectors

#### Related IP Cores

- HDMI 1.2/1.3 Transmitter/Receiver
- DisplayPort™ Transmitter
- SERDES (6.25Gbps or less)
- Ethernet PHY

#### Typical Application Diagram



**ASIC System-on-chip  
with Integrated HDMI Transmitter IP Core**

### Features

#### Highlights

- HDMI 1.2/DVI 1.0 Compliant
- Optional HDCP 1.2 Decryption Engine
- EIA/CEA-861-D
- Proven in TSMC 0.18um process
- TMDS clock rate up to 165MHz
- Programmable power management
- Ultra-low power consumption
  - Less than 5mW in 480p mode
  - Less than 5mW in 720p/1080i mode
- Programmable output swing and pre-emphasis
- Built-in Self Test (BIST)

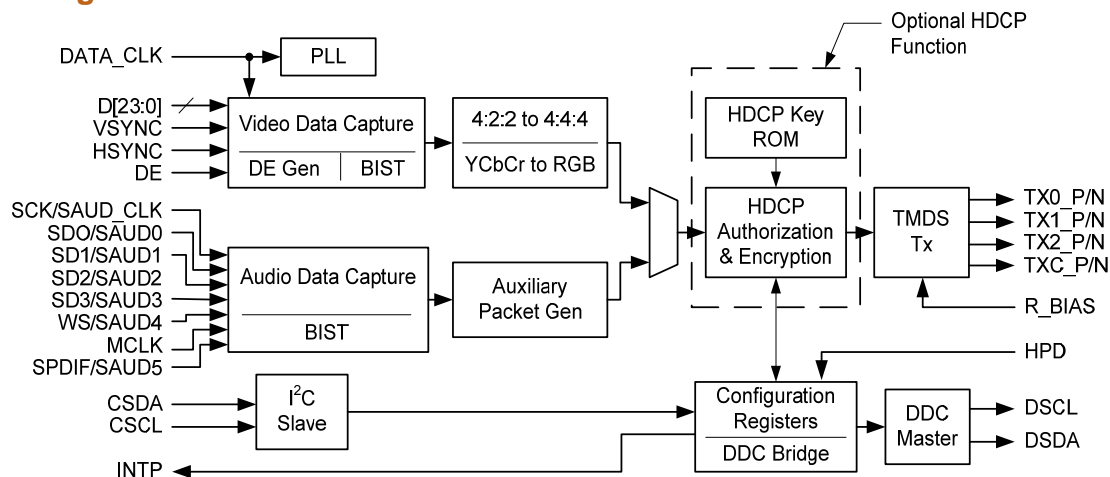
#### Video Interface

- Supports DVD and HD MPEG decoders
- 24-bit RGB/YCbCr 4:4:4
- 16/20/24-bit YCbCr 4:2:2
- 8/10/12-bit YCbCr 4:2:2 (ITU BT-601 and -656)
- 12bit DDR RGB/YCbCr 4:4:4
- xvYCC extended color space
- YCbCr-to-RGB Color space conversion
- 4:2:2-to-4:4:4 up-sample
- Backward compatible with DVI 1.1

#### Digital Audio Interface

- 8-channel I2S support Dolby Digital, and DVD-Audio
- S/PDIF supports PCM, Dolby Digital, DTS digital audio transmission
- Up to 6 channels 1-bit super audio support
- Programmable I2S channel mapping
- 2:1 and 4:1 down-sampling to handle 96 KHz and 192 KHz audio stream
- IEC60958 or IEC61937 compatible

### Block Diagram



### Worldwide Locations

Analogix is positioned to support customers worldwide with headquarters in Santa Clara, CA and design engineering and product support in Beijing, China. Analogix also has sales support offices in Taiwan and Japan. For more information: [www.analogix.com](http://www.analogix.com).