

Mobility DisplayPort (MyDP) to HDMI converter

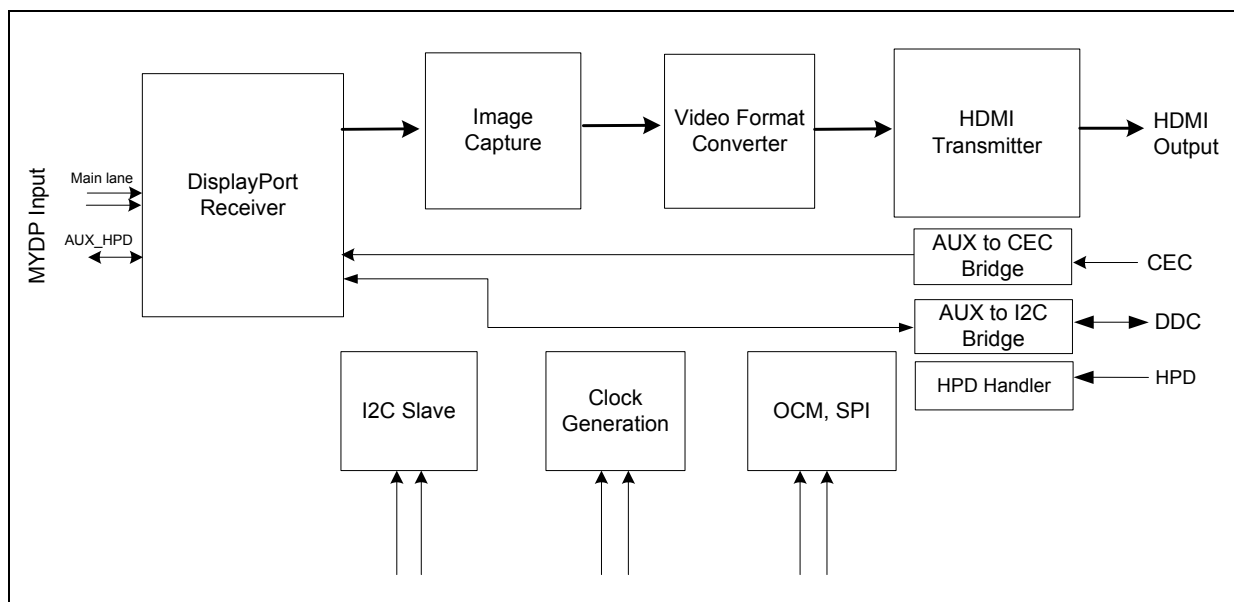
Data brief

Features

- Mobility DisplayPort® (MyDP) receiver
 - Link rate HBR2/HBR/RBR
 - 1 lane
 - AUX_HPD single-ended AC coupled signal, 1 Mbps
- HDMI 1.4 transmitter
 - Max data rate up to 2.97 Gbps/data pair
 - Color depth 24, 18 bits per pixel
 - 3D video timings (1920 x 1080 @ 30 Hz stereo)
 - CEC
- HDCP repeater with embedded keys
- AUX to I2C bridge for EDID pass through
- AUX to CEC bridge for CEC message protocol between MyDP source and TV
- Spread spectrum on DisplayPort interface for EMI reduction
- Bandwidth
 - Video resolution up to 1920 x 1080 @ 60 Hz
 - Audio 7.1 Ch up to 192 kHz sample rate
- Low power operation
 - Powered from MyDP source or from external USB +5 V supply
- Package
 - 81 BGA (5 x 5 mm)
- Power supply voltages
 - 3.3 V I/O; 1.2 V core

Applications

- Audio-video accessory (dongle) for smart phones/tablets
- TV front-end



1 Description

The STDP2550 is a Mobility DisplayPort to HDMI converter that facilitates streaming FHD 60 Hz video and audio from MyDP enabled smart phones and tablets to TVs, monitors, and projectors. The STDP2550 is a VESA Mobility DisplayPort (MyDP) standard compliant device, implementing a single lane DisplayPort receiver and AUX_HPD. The output port comprises an HDMI 1.4 compliant transmitter with CEC and HPD support. The MyDP standard is a digital audio-video interconnect based on the VESA DisplayPort standard for a mobile source device capable of streaming uncompressed audio and video. It uses the existing standard 5-pin connector commonly used for charging the portable mobile devices to stream the audio-video to the external display.

The STDP2550 uses ST's latest generation DisplayPort receiver technology that supports a single AV stream at HBR2 speed, a data rate of 5.4 Gbps per lane. Also, the HDMI transmitter in STDP2550 is based on advanced high-speed TMDS technology supporting link rate up to 2.97 Gbps and the stereo 3D formats. It can deliver 1080p 60 Hz video with a color depth of 24 bits per pixel and audio up to 8-channel at 192 Kb sample rate from a MyDP source to HDMI TV. This device complies with the HDCP 1.3 content protection scheme with an embedded key option for secure transmission of premium digital AV content. It can also act as an HDCP repeater for the downstream sink when used in a dongle application.

The AUX_HPD is a single-ended sideband channel used for low-speed data exchange between the MyDP source and the downstream sink. The AUX_HPD data transfer rate is 1 Mbps, which is quite adequate for handling I2C and CEC protocols. MyDP source also uses the AUX_HPD channel for the DPCD read-write access.

The AUX-to-I2C translator in the STDP2550 allows MyDP source to access EDID from the connected sink. Similarly, the AUX-to-CEC translator handles CEC message transfer from the HDMI sink to the MyDP source over the AUX_HPD line. This device has an on-chip microcontroller with SPI and I2C host interfaces for system configuration purposes. The STDP2550 implements a sink detection and monitoring feature that automatically puts the device into low power operation whenever the sink is disconnected.

2 Application overview

Figure 1. STDP2550 in mobile accessory (dongle) application

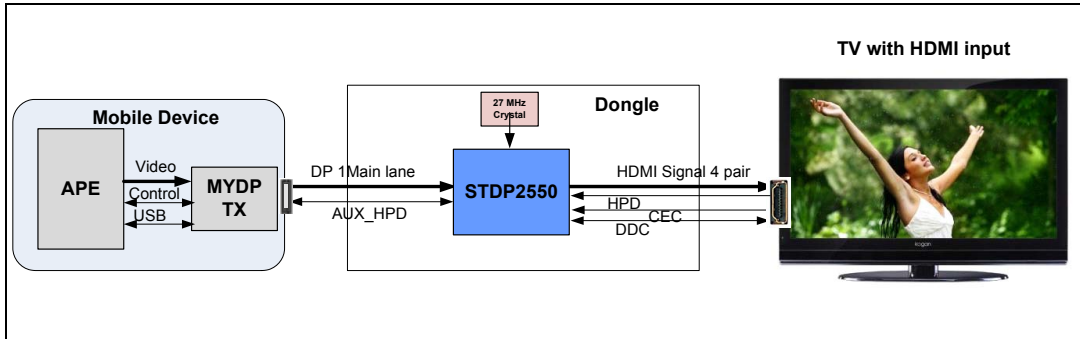
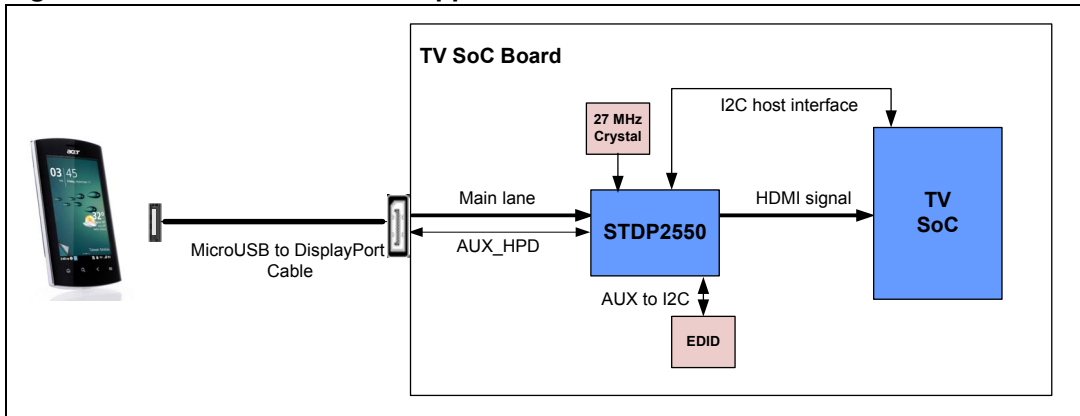


Figure 2. STDP2550 inside TV application



3 Feature attributes

3.1 Input interface

- Mobility DisplayPort
- Main link configuration (SST format only)
 - HBR2/HBR/RBR link rate
 - 1 lane
- AUX_HPD: 1 Mbps Manchester transaction format
 - I2C over AUX_HPD
 - CEC over AUX_HPD
- Pixel bit depth: 24 bpp, 18 bpp
- Color format: RGB
- Audio: Up to 192 Kb samples/sec, 8 Ch/sample, 24 bits/Ch

3.2 Output interface

- HDMI standard Ver.1.4 compliant
- Link rate: 2.97 Gbps/data pair max
- Pixel bit depth: 24 bpp, 18 bpp
- Color format: RGB
- Audio: Up to 192 Kb samples/sec, 8 Ch/sample, 24 bits/Ch
- DDC master port
- HPD monitoring
- HDMI RX 3.3 V termination monitoring

3.3 Supported video timings

- 1920 x 1080 (FHD) 60 Hz: 24 bits/pixel
- 1920 x 1080 (FHD) 30 Hz stereo 3D

3.4 Supported audio timings

- Up to 8-Ch LPCM; word length up to 64 x Fs; bit depth up to 32 bits, sample rate up to 192 kHz

3.5 Control channel interfaces

- AUX_HPD, I2C host interface, SPI (optional), and UART (UART for test/debug purposes only)

3.6 HDCP 1.3 support

- Key sets for DPRX and HDMI TX integrated in one-time programmable ROM (OTP)
- Standalone HDCP repeater capability

3.7 Package

- 81 BGA (5 x 5 mm), 0.5 ball pitch

3.8 Power supply voltages

- 3.3 V I/O; 1.2 V core

3.9 ESD

- 2 KV HBM, 500 V CDM

4 Ordering information

Table 1. Order codes

Part number	Description
STDP2550-AC	81 BGA (5 x 5 mm) delivered in trays
STDP2550-ACT	81 BGA (5 x 5 mm) delivered in tape and reel

4.1 ECOPACK®

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: www.st.com. ECOPACK® is an ST trademark.

5 Revision history

Table 2. Document revision history

Date	Revision	Changes
05-Oct-2012	1	Initial release.
07-May-2013	2	Updated Ordering information section.

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