STDP2500

Mobility DisplayPort (MyDP) to DP converter

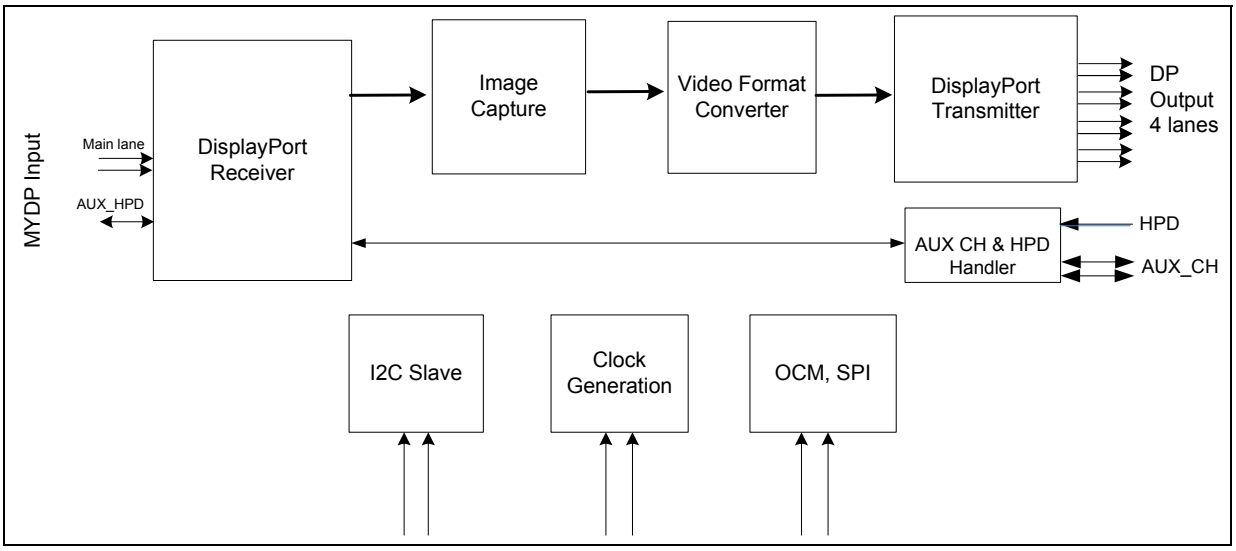
Data brief

Features

- Mobility DisplayPort® (MyDP) receiver
  - Link rate HBR2/HBR/RBR
  - 1 lane
  - AUX_HPD single-ended AC coupled signal, 1 Mbps
  - Supports eDP operation
- DisplayPort transmitter
  - DP 1.2a compliant
  - Link rate HBR2/HBR/RBR
  - 1, 2, or 4 lanes
  - AUX CH 1 Mbps
  - HPD monitoring
- HDCP repeater with embedded keys
- AUX_HPD translator to standard DP AUX CH and HPD
- Spread spectrum for EMI reduction
- Bandwidth
  - Video resolution up to 1920 x 1080 @ 60 Hz, 24 bits per color
  - Audio 7.1 Ch up to 192 kHz sample rate
- Low power operation
  - Powered from MyDP source or from DP sink
- Package
  - 81 TFBGA (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



1 Description

The STDP2500 is a Mobility DisplayPort to standard DisplayPort converter that facilitates streaming FHD 60 Hz video and audio from MyDP enabled smart phones and tablets to monitors and TVs with DisplayPort 1.2a compliant inputs. The STDP2500 is a VESA Mobility DisplayPort (MyDP) standard compliant device, implementing a single lane DisplayPort receiver and AUX_HPD. The output port comprises a standard DisplayPort 1.2a compliant transmitter with four main lanes, AUX channel, and HPD signal. 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 an external display.

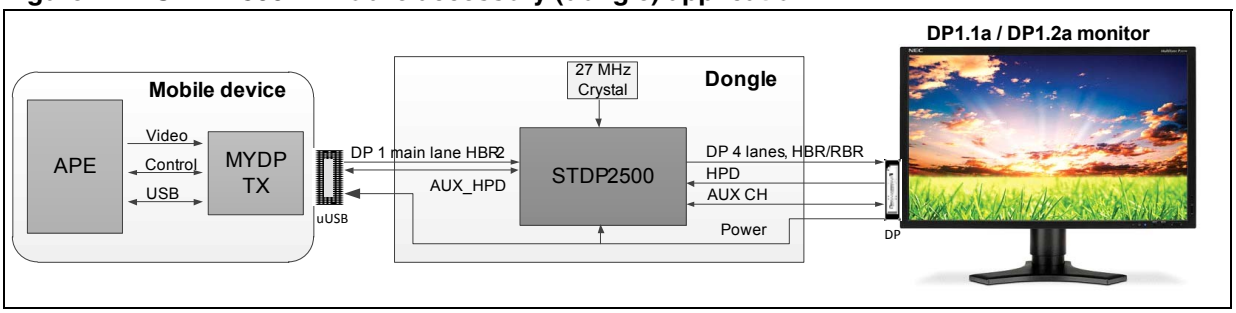
The STDP2500 uses ST's latest generation DisplayPort receiver technology that supports single AV stream at HBR2 speed, a data rate of 5.4 Gbps per lane. The DisplayPort output in STDP2500 is a four lane differential output capable of operating either at HBR2, HBR or RBR data rate. This device can convert audio-video stream received from a MyDP source on a single lane input at HBR2 data rate (5.4 Gbps) into two lanes output at HBR rate (2.7 Gbps) or four lane output at RBR rate (1.62 Gbps). It can deliver 1080p 60 Hz video with a color depth of 24 bits per pixel and audio up to 8 channels at 192 Kb sample rate from a MyDP source to DisplayPort1.1a based monitors. DisplayPort1.2a compliant monitors are capable of receiving MyDP input directly through a passive cable. STDP2500 complies with HDCP 1.3 content protection scheme with an embedded key option for secure transmission of premium digital AV content. It can also act as HDCP repeater for the downstream sink when used in a dongle application.

The AUX_HPD is a single-ended sideband channel that assists in low speed data exchange between the MyDP source and STDP2500. The AUX_HPD message handling is mapped to the corresponding AUX channel message and HPD signal at the output port for the downstream sink. The AUX_HPD data transfer rate is 1 Mbps which is adequate for handling I2C and IR protocols. The MyDP source also uses the AUX_HPD channel for the DPCD read-write access.

This device has an on-chip microcontroller with an optional SPI and I2C host interface for system configuration purpose. The STDP2500 implements a sink detection and monitoring feature that automatically puts the device into low power operation whenever the sink is disconnected. An STDP2500 based accessory (dongle) is powered from the downstream sink. In addition, DisplayPort1.2a compliant sinks in general are capable of charging the mobile source.

2 Application overview

Figure 1. STDP2500 in mobile accessory (dongle) 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
  - IR 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

- Standard DisplayPort 1.2a compliant
- Main link configuration (SST format only)
  - HBR2/HBR/RBR link rate
  - 4 lanes
- AUX_CH: 1 Mbps Manchester transaction format
  - I2C over AUX
  - IR over AUX
- HPD: IRQ_HPD monitoring
- Pixel bit depth: 24 bpp, 18 bpp
- Color format: RGB
- Audio: Up to 192 Kb samples/sec, 8 Ch/sample, 24 bits/Ch

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 and UART (UART for test/debug purposes only)

3.6 HDCP 1.3 support

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

3.7 Package

- 81 TFBGA (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
STDP2500-AC	81 BGA (5 x 5 mm) delivered in trays
STDP2500-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.
28-May-2012	2	Updated ordering information section.