

LT8611SX --- Product Brief

DisplayPort Repeater & HDMI1.4b/DVI1.0 Level Shifter

1. Features

● DisplayPort Repeating

- Compliant with Display port Dual-mode spec 1.1 with 4K HDMI support
- Programmable receiving equalization to compensate PCB and/or connector losses
- Integrated 50Ω termination resistors for AC coupled differential inputs
- Low Intra-pair and Inter-pair skews
- Support full DisplayPort link training
- Support DisplayPort all 4 levels of output
- Support Dual Mode DP Source Repeater & HDMI/DVI Source Level Shifter

● HDMI V1.4b/DVI V1.0 Level Shifting

- AC coupled TMDS level shifting operation up to 3 Gbit/s per lane (300 MHz character clock),
- Support video format 4K x 2K
- Support 3D video formats
- Support HDMI 2.0 4:2:0 format
- Programmable receiving equalization to compensate PCB and/or connector losses
- Integrated 50Ω termination
- Low Intra-pair and Inter-pair skews
- Disable feature to turn off TMDS inputs and outputs and to enter low-power state

● DDC Level Shifting

- Integrated DDC level shifting (3.3 V source side to 5 V sink side and vice versa)
- Support up to 400 kHz clock frequency

● DDC Buffer Support

- Integrated DDC buffer for HDMI cable adaptor or DVI cable adaptor application
- Responds to DDC read to address 81h with predetermined ID
- Feature enabled by pin DDET/HDMI_ID_EN

● HPD Level Shifting

- HPD non-inverting level shift from 0 V on the sink side to 0 V on the source side, from 5 V on the sink side to 3.3V on the source side
- Integrated 500 kΩ pull-down resistor on HPD sink input guarantees 'input LOW' when no display is plugged in

● General

- Power supply 3.3 V \pm 10 %
- ESD protection up to 8 kV
- Power-saving modes by source-side disablement (using output enable) as well as sink-side detection (using Hot Plug Detect)
- Transparent operation: no re-timing or software configuration required

2. General Description

LT8611SX integrates 1-to-1 DP Repeater & HDMI/DVI Level Shifter to simplify system level design and reduce system level cost for applications requiring single DP or HDMI/DVI input and single output device in personal computing system and other emerging digital appliances. LT8611SX can be configured either as a DP source repeater or as a HDMI/DVI source level shifter by MODE pin. When used as a DP repeater, it repeats four lanes of low-swing AC-coupled differential input signals to a DP receiver, without level shifting, to increase transmission distance. When used as a HDMI/DVI level shifter (default setting), it converts four lanes of low-swing AC-coupled differential input signals to DVI and HDMI compliant open-drain current-mode differential output signals, up to 3 Gbit/s per lane. Each of these lanes provides a level-shifting differential buffer to translate from low-swing AC-coupled differential signaling on the source side, to TMDS-type DC-coupled differential current-mode signaling terminated into 50Ω to 3.3V on the sink side. Equipped with receiver side equalization of up to 10dB at

data rate of 3 Gb/s, LT8611SX can either extend the DisplayPort signal or level-shifting the dual mode DisplayPort signal for long distance on both sides.

The LT8611SX provides a single-ended active inverting buffer for voltage translation of the HPD signal from 5V on the sink side to 3.3V on the source side. And, it provides a channel for level shifting of the DDC channel between 3.3V source-side and 5V sink-side. The chip also integrates a DDC buffer, defined by VESA DisplayPort Interoperability Guideline, for correct operation when connected to a dual mode DisplayPort source device.

The level shifting signal sources typically are from a display source with multi-mode I/O, which supports multiple display standards, e.g., DisplayPort, HDMI and DVI. These I/Os are either too far away from the connector on the board or they do not match with the display devices' electrical specifications, for e.g. DVI V1.0 or HDMI V1.4b. With LT8611SX, chip set vendors are able

to implement such reconfigurable I/Os on multi-mode display source devices, allowing the support of multiple display standards while keeping the number of chip set I/O pins low, or simply repeat the high-speed HDMI, DVI signal on the board or off the board, and give the board designers more freedom on chip placement, and signal propagation distance. Figure 3.1 is a typical application system diagram.

LT8611SX is powered from a single 3.3V power supply consuming a small amount of power and is offered in 4 types of package.

3. Applications

- PC Motherboard / Graphics Card
- DP to HDMI/DVI Cable Adaptor
- Digital Set-Top-Box
- 1-to-1 DP Repeater

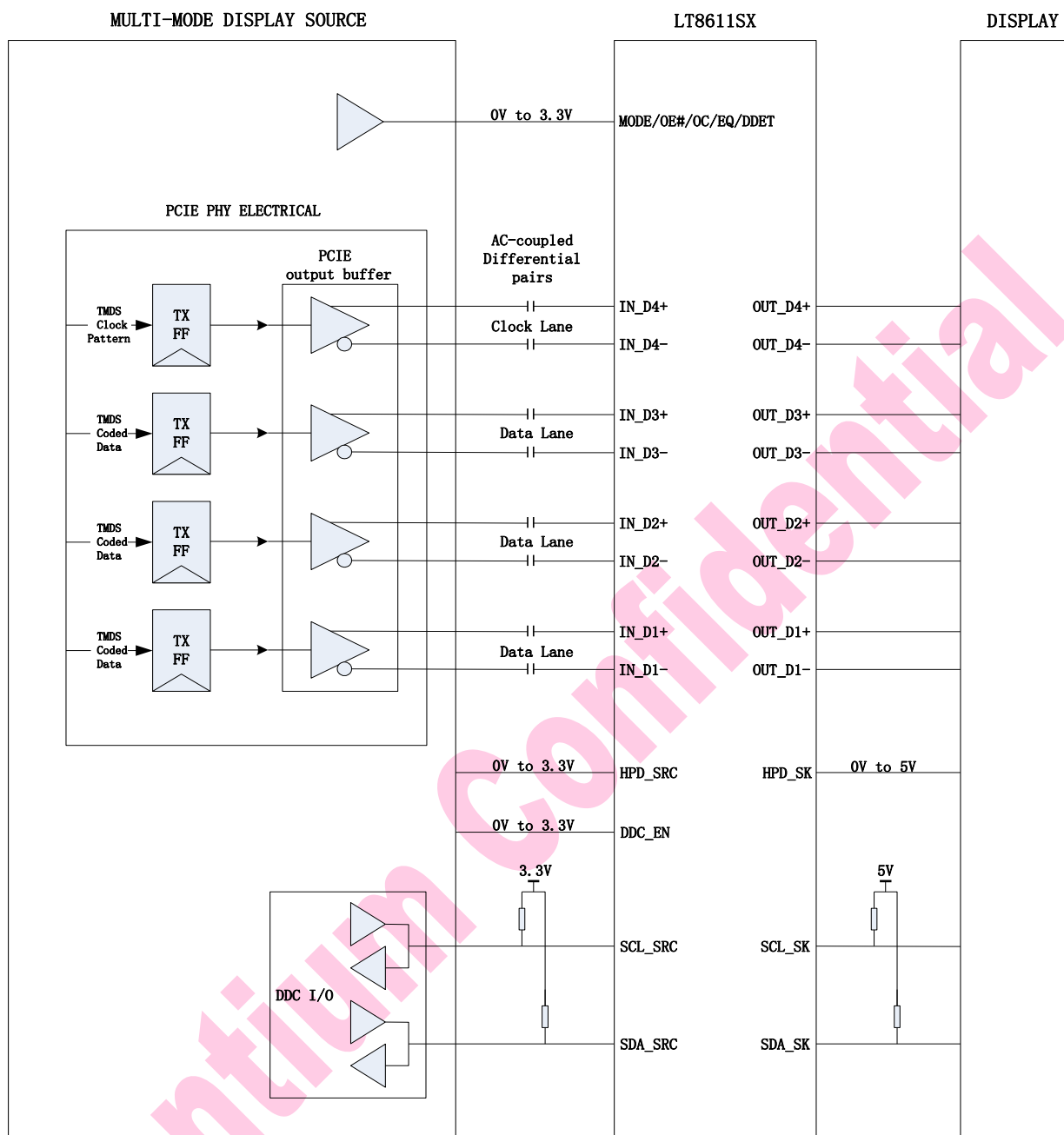


Figure 3.1 Typical Application System Diagram

Remark: TMDS clock and data lanes can be assigned arbitrarily and interchangeably to D[4:1].

4. Ordering Information

Table 4.1 Ordering Information

Part Number	Operating Temperature Range	Package	Packing Method	MPQ
LT8611SX	-40° C to +85° C	QFN40 (5*5)	Tape and Reel	3000pcs
LT8611SXA	-40° C to +85° C	QFN48 (7*7)	Tape and Reel	3000pcs
LT8611SXB	-40° C to +85° C	QFN48 (7*7)	Tape and Reel	3000pcs
LT8611SXD	-40° C to +85° C	QFN32 (3*6)	Tray	4900pcs

Copyright © 2016-2024 Lontium Semiconductor Corporation, All rights reserved.

Lontium Semiconductor Proprietary & Confidential

This document and the information it contains belong to Lontium Semiconductor. Any review, use, dissemination, distribution or copying of this document or its information outside the scope of a signed agreement with Lontium is strictly prohibited.

LONTIUM DISCLAIMS ALL WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING THOSE OF NONINFRINGEMENT, MERCHANTABILITY, TITLE AND FITNESS FOR A PARTICULAR PURPOSE. CUSTOMERS EXPRESSLY ASSUME THEIR OWN RISK IN RELYING ON THIS DOCUMENT.

LONTIUM PRODUCTS ARE NOT DESIGNED OR INTENDED FOR USE IN LIFE SUPPORT APPLIANCES, DEVICES OR SYSTEMS WHERE A MALFUNCTION OF A LONTIUM DEVICE COULD RESULT IN A PERSONAL INJURY OR LOSS OF LIFE.

Lontium assumes no responsibility for any errors in this document, and makes no commitment to update the information contained herein. Lontium reserves the right to change or discontinue this document and the products it describes at any time, without notice. Other than as set forth in a separate, signed, written agreement, Lontium grants the user of this document no right, title or interest in the document, the information it contains or the intellectual property in embodies.

Trademarks

Lontium™ 龙迅™ and ClearEdge™ is a registered trademark of Lontium Semiconductor. All other brand names, product names, trademarks, and registered trademarks contained herein are the property of their respective owners.

Visit our corporate web page at: www.lontiumsemi.com

Technical support: support@lontium.com

Sales: sales@lontium.com