LT7622UX --- Product Brief

HDMI2.0/DP1.4 with Type-C to HDMI2.0 and Quad-port MIPI/LVDS Mixed Switch

1. Features

- **HDMI2.0 RX&TX**
  - Compliant with HDMI2.0b, HDMI1.4 and DVI1.0
  - Data rate up to 6Gbps
  - Support HDCP 1.4/2.3
  - Support HDCP repeater
  - Support RGB 8/10/12 bpc, YCbCr4:4:4/ YCbCr4:2:2/ YCbCr4:2:0 8/10/12 bpc
  - Support HDR10
  - Support CEC
  - Support VRR
  - Integrated EDID shadow (max 512-byte)
  - Support ARC RX
  - Support EARC RX
  - Support lane swap and PN swap
- **USB Type-C**
  - Compliant with VESA DisplayPort Alt Mode on USB Type-C Standard 1.0b
  - DP Alt Mode support pin assignment C and E
  - Compliant with USB power delivery specification 3.0
  - Compliant with USB Type-C cable and connector specification 1.3
  - Built-in single CC logic and PD controller for charger and normal communication
  - Data roles supported: UFP and DFP
  - Power roles supported: source, sink and DRP
  - Support USB Billboard
- **DP1.4a/eDP1.4b Receiver**
  - Compliant with DisplayPort specification 1.4a for 1.62Gbps, 2.7Gbps, 5.4Gbps and 8.1Gbps
  - Compliant with Embedded DisplayPort specification version 1.4b
  - Support SSC
  - Support DisplayPort 1/2/4 lanes
  - Support ASSR for eDP
  - Support HDCP 1.3/2.3
  - Support HDCP repeater
  - Support SST mode
  - Support RGB 6/8/10/12 bpc, YCbCr4:4:4/YCbCr4:2:2/ YCbCr4:2:0 8/10/12 bpc
  - Support HDR10
  - Support Adaptive-Sync
  - Support Horizontal Blanking Expansion
- **Digital Audio Input or Output**
  - I2S interface supports up to 8-channel audio, with sample rates of 32~192 KHz and sample sizes of 16~24 bits
  - TDM interface supports up to 8-channel audio, with sample rates of 32~192 KHz and sample sizes of 16~24 bits
  - SPDIF interface supports LPCM, Dolby Digital, DTS digital audio up to 192KHz frame rate
  - Compliant with IEC60958 or IEC61937
- **Four-Port MIPI® DSI/CSI Transmitter**
  - Compliant with D-PHY1.2 & DSI 1.3 & CSI-2 1.3 ; 1 clock lane, and 1/2/3/4 configurable data lanes ; 2.5Gbps per data lane
  - Compliant with C-PHY1.0 & DSI-2 1.0 & CSI-2 2.0 ; 1/2/3 configurable data trio ; 2.5Gsps per data trio
  - Support 1/2/4 configurable ports
  - Support only 1 port for CSI D-PHY 8-lane mode
  - Support overlap mode
  - DSI Support 16/20/24-bit YCbCr4:2:2, 16/18/24/30-bit RGB
  - CSI Support RGB888/666/565, YUV422 8/10bit,

YUV420 8bit(legacy)
- Support side by side 3D
- D-PHY support port swap, lane swap and PN swap
- C-PHY support port swap and trio swap

- **Four-Port LVDS Transmitter**
  - Compatible with VESA and JEIDA standard
  - Support 1/2/4 configurable ports
  - 1 Clock lane and 3/4/5 configurable data lanes
  - Data rate up to 1.2Gbps per data lane
  - Support up to 8K@30Hz YCbCr422 8bit
  - Support up to 4K@120Hz YCbCr422 8bit
  - Support up to 4K@60Hz RGB 10bit
  - Support side by side 3D
  - Programmable transmitter swing
  - Support SSC
  - Support lane swap and PN swap
- **Resolution**
  - HDMI2.0 supports up to 4K@60Hz RGB 8bpc
  - DP Receiver supports up to 4K@120Hz RGB 8bpc with reduced blanking,4K@144Hz YCbCr422 8bit or 8K@30Hz RGB 8bpc with reduced blanking
- **OSD**
  - Support font-based and bit-map OSD
  - Support up to two separate OSD windows
  - Support non-rectangular display
  - Support adjustable transparency
  - Support copying windows in 3D mode
- **Miscellaneous**
  - CSC: RGB <-> YCbCr4:4:4 <-> YCbCr4:2:2<-> YCbCr4:2:0
  - Integrated 100/400KHz I2C slave
  - Integrated microprocessor
  - External oscillator 25MHz, +/-50ppm
  - Embedded SPI flash for firmware and HDCP keys
  - Firmware update through AUX, I2C or USB interface
  - Power supply: 3.3V and 1.1V

2. General Description

LT7622UX is a high performance HDMI2.0 or DP1.4a with Type-C to HDMI2.0 and MIPI/LVDS mixed switch chip for Display application.

HDCP RX as the upstream of HDCP repeater, can cooperate with HDCP TX of other chips to realize the repeater function.

For HDMI2.0 input, LT7622UX can be configured as 3/4 lanes. Adaptive equalization makes it suitable for long cable application and the maximum bandwidth up to 18Gbps.

For HDMI2.0 output, LT7622UX can be configured as 3/4 lanes. The maximum bandwidth is up to 18Gbps.

Both HDMI2.0 input and output allow for the highest resolutions of 4K@60Hz.

The Type-C/DP1.4a input support data rate up to 8.1Gbps be configured as 1/2/4 lanes. Adaptive equalization makes it suitable for long cable application and the maximum bandwidth is up to 32.4Gbps.

For MIPI output, LT7622UX features configurable single-port or dual-port or quad-port MIPI®DSI/CSI with 1 high-speed clock lane and 1~4 high-speed data lanes operating at maximum 2.5Gbps/lane with D-PHY, which can support a total bandwidth of up to 40Gbps for four port. LT7622UX also support 2.5Gsps/trio with C-PHY, which can support a total bandwidth of up to 68.4Gbps for four port.

For LVDS output, LT7622UX can be configured as single, dual or quad-port LVDS with 1 high-speed clock lane, and 3~5 high-speed data lanes, operating at maximum 1.2Gbps per lane, which can support a total bandwidth of up to 24Gbps. LT7622UX supports flexible video data mapping path for 2D and 3D applications.

Digital audio output interface is available, including I2S/TDM/SPDIF. Digital audio input interface is available, including I2S/SPDIF.

The device is capable of automatic operation which is enabled by an integrated microprocessor that uses an embedded SPI flash for firmware storage. System control is also available through the configuration I2C slave interface.

3. Applications

- Mixed Switch
- Mobile system
- Display
- Video capture

- Video conferencing

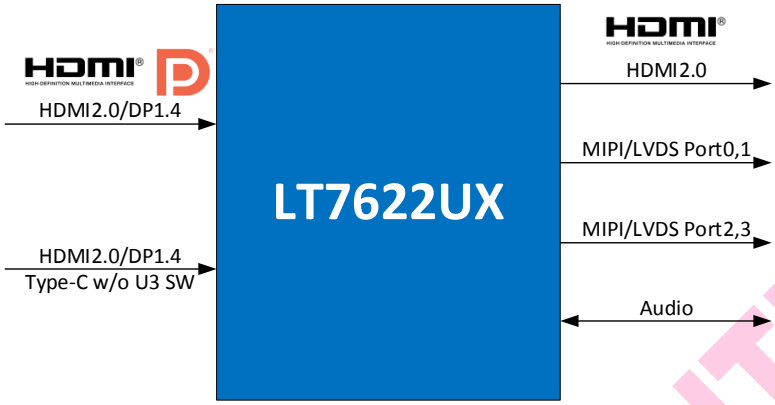

Figure 3.1 Application Diagram

4. Ordering Information

Table 4.1 Ordering Information

Product Name	Part Number	Product Status	Package	Bonding Wire	Grade	Operating Temperature Range	Stack Die Option	Packing Method	MPQ
LT7622UX	LT7622UX_U1Q00CEM	Preview	QFN128 (14*14)Saw	Cu	E	-40℃ to +85℃	M	Tray	TBD

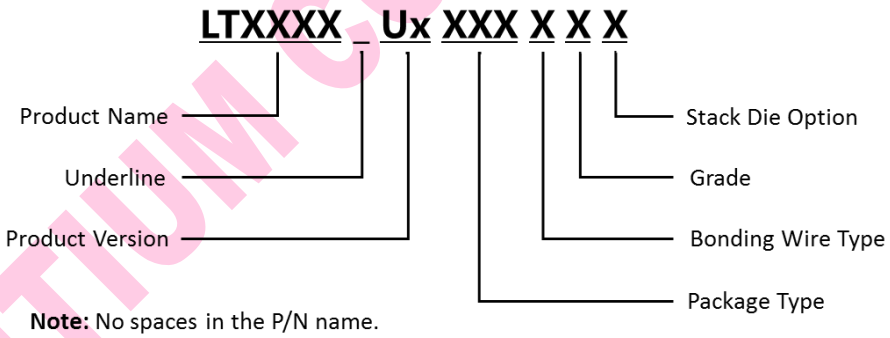

Figure 4.1 Part Number Naming Rules

Visit our corporate web page at: www.lontiumsemi.com
Technical support: support@lontium.com
Sales: sales@lontium.com