LT8668SXC --- Product Brief

High Definition Display Controller

1. Features

- **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 dual 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 DisplayPort 1/2/4 lanes
  - Support HDCP 1.3/2.3
  - Support HDCP repeater
  - Support RGB 6/8/10/12 bpc, YCbCr4:4:4/YCbCr4:2:2/ YCbCr4:2:0 8/10/12 bpc
  - Support up to 8K@30Hz RGB 6bpc, YCbCr4:2:2 10 bpc or YCbCr4:2:0 12 bpc
  - Support up to 4K@120Hz RGB 6bpc, YCbCr4:2:2 10 bpc or YCbCr4:2:0 12 bpc
  - Support up to 8K@60Hz DSC pass-through
  - Support static HDR10
  - Support ASSR for eDP
  - Support down spread up to 0.5%
  - Support SST/MST mode

- **HDMI2.1 Receiver**
  - Compliant with HDMI2.1, HDMI2.0b, HDMI1.4 and DVI1.0

- Data rate up to 8Gbps
- 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 up to 8K@30Hz RGB/YCbCr4:4:4/ YCbCr4:2:2 8bpc or YCbCr4:2:0 12 bpc
- Support up to 4K@120Hz RGB/YCbCr4:4:4/ YCbCr4:2:2 8bpc or YCbCr4:2:0 12 bpc
- Support up to 8K@60Hz DSC pass-through
- Support static HDR10
- Support FEC
- Support CEC
- Support VRR
- Integrated EDID shadow (max 512-byte)
- Support ARC

- **DP1.4a/eDP1.5 Transmitter**
  - Compliant with DisplayPort specification 1.4a for 1.62Gbps, 2.7Gbps, 5.4Gbps, 8.1Gbps
  - Compliant with Embedded DisplayPort specification version 1.5
  - Support DisplayPort 1/2/4 lanes
  - Support HDCP 1.3/2.3
  - Support HDCP repeater
  - Support RGB 6/8/10/12 bpc, YCbCr4:4:4/YCbCr4:2:2/ YCbCr4:2:0 8/10/12 bpc
  - Support up to 8K@30Hz RGB 6bpc, YCbCr4:2:2 10 bpc or YCbCr4:2:0 12 bpc
  - Support up to 4K@120Hz RGB 6bpc, YCbCr4:2:2 10 bpc or YCbCr4:2:0 12 bpc
  - Support up to 8K@60Hz DSC pass-through
  - Support static HDR10
  - Support FEC
  - Support Adaptive-Sync
  - Support ASSR for eDP
  - Support SSC

- Support SST/MST pass-through

● **HDMI2.1 Transmitter**

  ▪ Compliant with HDMI2.1, HDMI2.0b, HDMI1.4 and DVI1.0
  ▪ Data rate up to 8Gbps
  ▪ 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 up to 8K@30Hz RGB/YCbCr4:4:4/ YCbCr4:2:2 8bpc or YCbCr4:2:0 12 bpc
  ▪ Support up to 4K@120Hz RGB/YCbCr4:4:4/ YCbCr4:2:2 8bpc or YCbCr4:2:0 12 bpc
  ▪ Support up to 8K@60Hz DSC pass-through
  ▪ Support static HDR10
  ▪ Support FEC
  ▪ Support VRR
  ▪ Support CEC
  ▪ Support ARC

● **eDP1.4b Transmitter**

  ▪ Compliant Embedded DisplayPort specification version 1.4b for 1.62Gbps, 2.7Gbps, 5.4Gbps
  ▪ Support 1/2/4/8 lanes
  ▪ Support RGB 6/8/10/12 bpc, YCbCr4:4:4/YCbCr4:2:2/ YCbCr4:2:0 8/10/12 bpc
  ▪ Support up to 4K@120Hz RGB 8bpc, YCbCr4:2:2 10 bpc or YCbCr4:2:0 10 bpc
  ▪ Support up to 8K@60Hz DSC pass-through
  ▪ Support static HDR10
  ▪ Support Adaptive-Sync for 4-lane mode
  ▪ Support ASSR
  ▪ Support SSC

● **eDPx Transmitter**

  ▪ Support data rate up to 3Gbps
  ▪ Support 1/2/4/8 pairs
  ▪ Support 1/2/4 sections
  ▪ Support RGB/YCbCr 8/10 bpc
  ▪ Support up to 4K@60Hz
  ▪ Support SSC

● **Video Process**

  ▪ Gamma adjustment
  ▪ Zoom scaling up and down(4K max)

  ▪ Support font-based and bit-map OSD

● **Digital Audio Input or Output**

  ▪ I2S interface supports up to 2-channel audio, with sample rates of 32~192 KHz and sample sizes of 16~24 bits
  ▪ SPDIF interface supports PCM, Dolby digital, DTS digital audio at up to 192KHz frame rate
  ▪ Compliant with IEC60958 or IEC61937

● **DSC Decoder and Encoder**

  ▪ Compliant with DSC 1.2a
  ▪ Support up to hactive 4096
  ▪ Support up to pixel clock 1.2GHz
  ▪ Support 1/2/4 slices
  ▪ Support color space RGB, YCbCr4:4:4, YCbCr4:2:2, and YCbCr4:2:0
  ▪ Support color depth 8bit and 10bit
  ▪ Support bpp precision 1 bit
  ▪ Support only constant refresh rate

● **Miscellaneous**

  ▪ CSC: RGB <-> YUV444 <-> YUV422<-> YUV420
  ▪ Integrated 100/400KHz I2C slave
  ▪ External oscillator 25MHz, +/-50ppm
  ▪ Integrated microprocessor
  ▪ Embedded SPI flash for firmware and HDCP keys
  ▪ Support PWM control
  ▪ Firmware update through SPI or I2C or USB interface
  ▪ Power supply: 3.3V and 1.1V

2. General Description

LT8668SXC can be configured to work under HDMI2.1 standard with maximum 8Gbps data rate.

LT8668SXC also can be configured to work under Type-C input or DP1.4a with up to 8.1Gbps data rate.

For eDP1.4b output, it consists of 8 data lanes, supporting RBR (1.62Gbps), HBR (2.7Gbps) and HBR2 (5.4Gbps) link speeds. The build-in optional SSC function reduces EMI effect on EMI-concerned system application.

For eDPx output, it consists of 8 data lanes, with operating at maximum 3Gbps per lane, can support 4K@60Hz.

Two digital audio output interfaces are available I2S and

SPDIF. The I2S interface supports 2-ch LPCM and the SPDIF interface supports 2-ch LPCM or compressed audio, both at maximum 192 KHz sample rate.

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

- Display System on Motherboard, Monitor
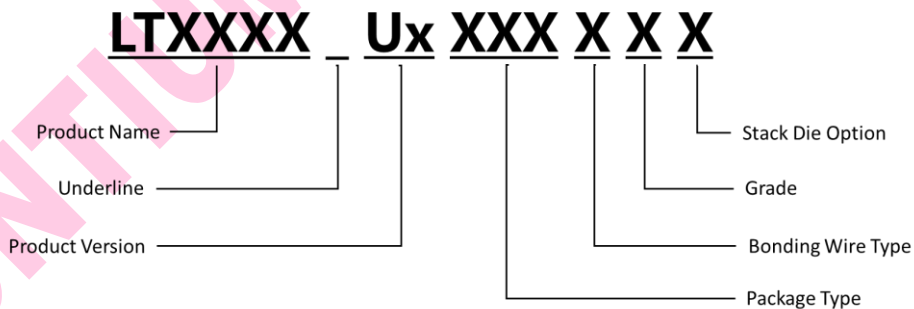- Display System for PCs and embedded applications

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
LT8668SXC	LT8668SXC_U3Q02AED	MP	QFN88 (10*10)Saw	Au	E	−40°C to +85°C	D	Tray	1680pcs
	LT8668SXC_U3Q02AAD	Preview	QFN88 (10*10)Saw	Au	A	−40°C to +105°C	D	Tray	1680pcs

Note: LT8668SXC_U3Q02AAD is an automotive grade device which is qualified by AEC-Q100 Grade 2 testing.

Note: No spaces in the P/N name.

Figure 4.1 Part Number Naming Rules

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