LT86121EX --- Product Brief

HDMI2.1/DP1.4a Repeater with Type-C

1. Features

- **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
- **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 SSC
- **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
- **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

- **Digital Audio Input and Output**
  - I2S 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
- **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
  - Integrated microprocessor
  - External oscillator 25MHz, +/-50ppm
  - Embedded SPI flash for firmware and HDCP keys
  - Firmware update through SPI or I2C or USB interface
  - Power supply: 3.3V and 1.1V

2. General Description

The LT86121EX is a high performance HDMI2.1 or DP1.4a repeater. In long cable application, it should be paired with LT86121EX.

Both the HDMI2.1 input and output support data rate up to 8Gbps which provides sufficient bandwidth for 4K@120Hz, 8K@30Hz or 8K@60Hz with compression data (pass-through). Also HDCP2.3 is supported for data decryption and encryption.

Both the Type-C or DP1.4a input and output support data rate up to 8.1Gbps which provides sufficient bandwidth for 4K@120Hz, 8K@30Hz or 8K@60Hz with compression data (pass-through). Also HDCP2.3 is supported for data decryption and encryption.

In paired mode, DSC can be used to reduce data rate and hence bandwidth requirement. Furthermore, FEC can be activated to correct data error and help to enhance system error tolerance level. These unique techniques together will significantly extend transmission distance.

Two digital audio interfaces are available, I2S and SPDIF. The I2S interface supports 8-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

- Active Cables
- Surveillance

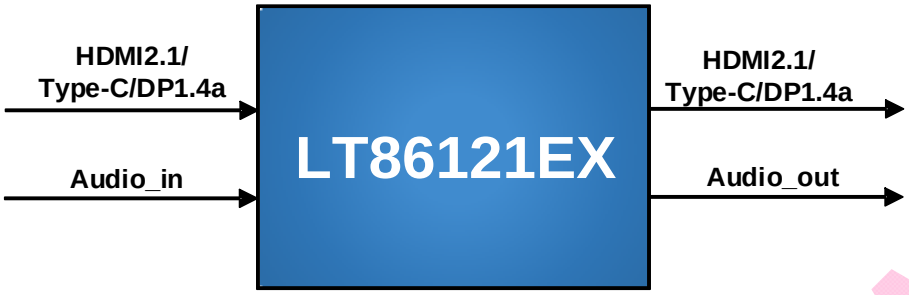

Figure 3.1 Application Diagram

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
LT86121EX	LT86121EX_U3Q02AED	MP	QFN88 (10*10)Saw	Au	E	−40°C to +85°C	D	Tray	1680pcs

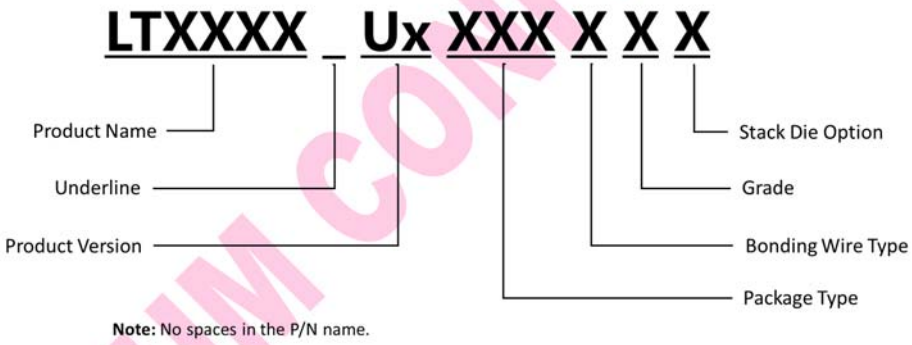

Figure 4.1 Part Number Naming Rules

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