LT87101C --- Product Brief

Type-C Re-driver

1. Features

- Compliant to Type-C r1.2 Standard
- Compatible with USB3.1 Gen-1 and USB2.0 Standard
- Support DP Alt Mode with Pin Assignment C,D,E&F
- Support HDMI1.4b Alternate Mode
- Support CC Interception via USB PD2.0
- Support SOP'/SOP" Communication
- Support up to 5.4Gb/s Data Rates
- Integrate AUX Interception
- Programmable Input Equalization
- Programmable Output Swing and De-emphasis
- Automatic recognition of cable plug insertion side
- Internal MCU and Flash for Firmware Upgrade
- Support External I2C Debug
- 1.8V/3.3V Power Supply
- Packaged in 5mmx5mm QFN40

2. General Description

LT87101C is an active EMCA chip for full-featured USB Type-C cable. It supports SOP/SOP'/SOP" interaction providing a scheme to determine the characteristics of the cable through PD2.0-based CC communication. Signal quality is deeply-optimized and enhanced by performing cable or board trace loss compensation under USB2.0, USB3.1 Gen-1, HDMI1.4b and DP1.2 specification respectively according to application.

The four Type-C signal differential pairs, TX1+/-(A2/A3), TX2+/-(B2/B3), RX1+/-(A11/A10) and RX2+/-(B11/B10) are re-shaped through four bi-directional receiver-transmitter channels, where TX1+/- and RX1+/- are swappable with TX2+/- and RX2+/- respectively. The polarity of each differential pair is also swappable. Especially, the position of Plug-A and Plug-B can also be exchanged. EMCA embedded with LT87101C will automatically identify which side of the cable is inserted to Type-C source and configure the data transmission direction accordingly. The input receiver of LT87101C implements a multi-level programmable linear equalizer, supporting up to 25dB loss compensation due to Inter-Symbol Interference (ISI). The transmitter re-drives the received signal with multi-level programmable output swing and maximum 6dB de-emphasis. USB2.0 data D+/D- is also equalized and re-driven inside LT87101C.

A Low-Frequency Periodic Signal (LFPS) detection block, automatic plug and unplug by remote receiver termination sensing and state machine control are also integrated on each channel for normal USB3.1 Gen-1 application. The build-in AUX interceptor monitors AUX communication and automatically adjust equalizing and signaling levels in response to DP Link Training Commands.

LT87101C internally integrates an 8-bit OCM and flash memory (stacked die) to configure and run program. Online software upgrade is also supported.

The LT87101C is fabricated in advanced CMOS process and implemented in a small outline 5mmx5mm QFN40 package. This package is RoHS compliant and specified to operate from -40°C to +85°C.

3. Applications

- Smartphone, Tablet and Other Mobile Devices
- VR/AR Helmet Display and Home Entertainment
- PC, Notebook, All-in-Ones Computer and Docking
- Active Type-C EMCA Cable

4. Ordering Information

Table 4.1.1 Ordering Information

Part No.	Operating Temp. Range	Package	Packing
LT87101C	-40°C to +85°C	QFN40 (5*5)	Tray
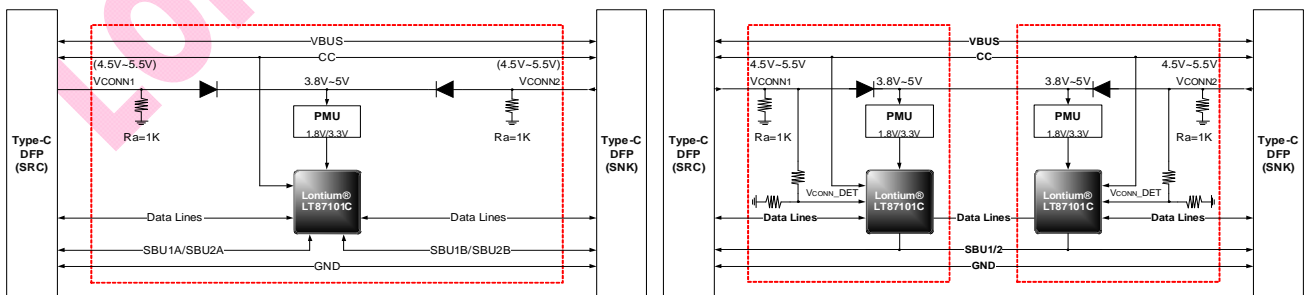
Figure 1. LT87101C Typical Application Diagram

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