Replacing EXAR XR-T5684 with an LXT301Z Short-Haul Transceiver

Application Note

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As of January 15, 2001, this document replaces the Level One document known as *AN127*.

Application Note

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1.0 General Description

Intel's LXT301Z single LIU can easily replace EXAR's XR-T5684 short-haul transceiver. Depending on the design, this application note shows that only minor changes are needed in the conversion. In addition, the LXT301Z transceiver offers the designer performance advantages such as T1 and E1 operation, line rate reference clock, and minimum 13.6 dB receiver sensitivity

1.1 Description of Interface

Both EXAR's and Intel's transceivers come in 28 pin PLCC and DIP packages. They have a similar pinout with 22 pins and functions in common. Table 1 describes the differences between the two devices. It names the differing pins and functions for each transceiver:

Table 1. Differences in Function of Pins

Pin	T5684 Function	LXT301Z Function
1-LCLK	8X or 16X clock	MCLK-1X master clock
5-MODE	Synch RX data	Host control
9-PD	Divider	1k pull-up to VCC
10-CLKDS	Clock disable	n/c
27-N/C	No connect	LLOOP, low = off
26-TEST	Factory test mode	RLOOP, low = off

1.2 Features

1.2.1 Digital Interface

Two digital signals have functions different enough to require further explanation: CLKDS and MODE. The possibilities that can occur with CLKDS in the T5684 are:

- If CLKDS is at a logic level low (off), cutting the trace to pin 10 will work with the LXT301Z. This is shown in Figure 1.
- If CLKDS is at a logic level high (on), feeding a 2-input AND gate with RCLK and inverted CLKDS will do the same function. Figure 2 shows how to do this.

MODE has two possibilities with the T5684 also:

- When MODE is at a logic level high (on) with the T5684, cutting the trace and bringing pin 5 to a logic level low will work with the LXT301Z. This is shown in Figure 1.
- When MODE is at a logic level low (off) with the T5684, Exar states in the data sheet that RCLK is unrelated to RPOS and RNEG. If there is a need for this feature, call Applications Engineering at Intel for technical support.

Figure 1. Example of Similar Intel and Exar Circuits

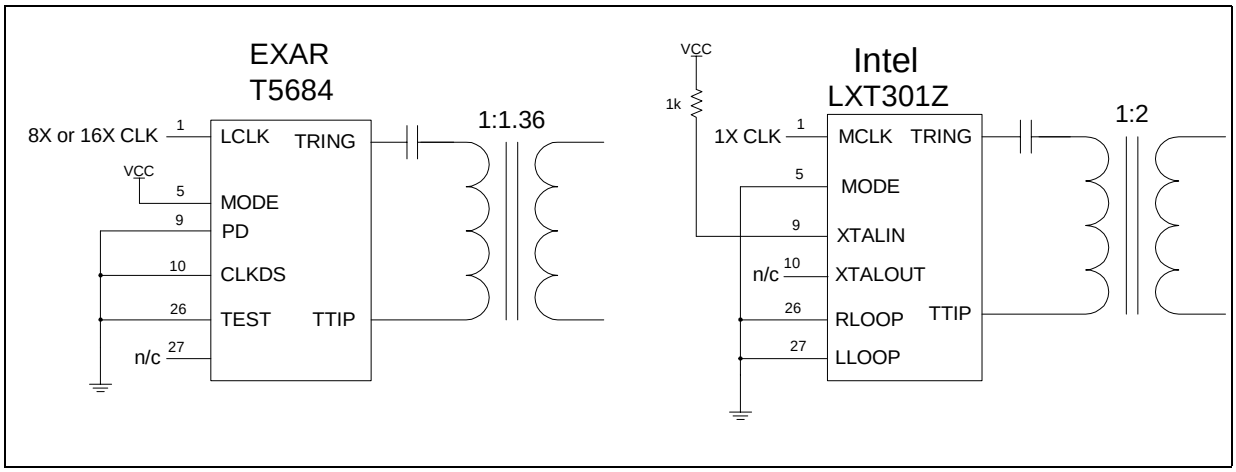
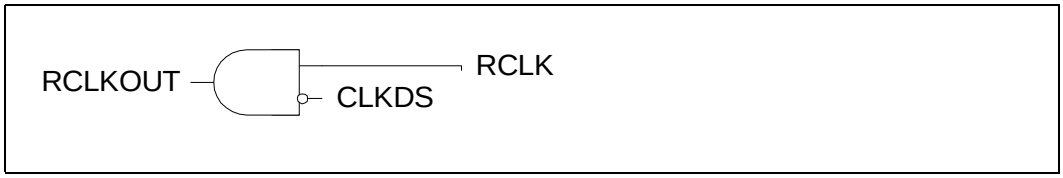


Figure 2. CLKDS Logic



1.3 Analog Interface

The transformer turns ratio is different between the Exar T5684 and the LXT301Z LIU.

The T1 transmit transformer turns ratio changes from 1:1.36 to 1:2 when using the LXT301Z. This is shown in Figure 1. Transformers with this turns ratio are readily available in drop-in replaceable packages. Please look at the Intel web site for more information about transformers at http://www.developer.intel.com/design/network.

The data sheets on our web site, have the latest information for the LXT301Z line interface unit.

1.4 Additional Advantages

Easier troubleshooting and simple upgrades come with the LXT301Z. Two diagnostic functions, local loopback and remote loopback, assist in finding circuit faults. Upgrading from the LXT301Z to the LXT304A is simple, since these LIU's are pin compatible. LXT304A features include reduced power consumption and jitter attenuation (with an external crystal) in either the transmit or the receive path. Please consult the distributor or Intel Technical Support for more solutions.