

AC coupling LVDS outputs of ZL40230, ZL40321, ZL40234 and ZL40235

Introduction

The LVDS drivers of the ZL40230, ZL40231, ZL40234, and ZL40235 are current mode drivers, and require a DC path between the P and the N outputs to operate properly. Most LVDS interconnects are DC-coupled, with a 100Ω impedance terminating the differential trace, but in some cases an IC manufactures will specify that their LVDS inputs be AC-coupled. This application note shows how to AC couple the current mode LVDS drivers of the above devices while providing a DC current path.

Externally Terminated Internally Biased Receiver

When the receiver is internally biased, but requires external termination, the circuit in Figure 1 should be used. The circuit provides a DC path between the P and N outputs of the differential pair through the 100Ω resistor. The resistor and the AC coupling capacitors are located as close to the receiver as possible. The 100Ω resistor terminates the line and minimizes reflections. The stubs between the resistor and the AC coupling caps should be kept as small as possible (otherwise reflections could occur).

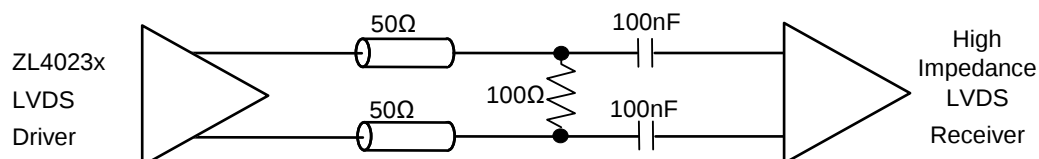


Figure 1 AC-coupling for Externally Terminated LVDS Receivers

Internally Terminated and Biased Receiver

When the receiver is both internally biased and terminated, a 400Ω resistor can be added on the driver side of the AC-coupling capacitors, as shown in Figure 2. This provides the DC path for the driver circuit. Reflections are suppressed by the 100Ω termination in the receiver. The amplitude of the signal at the circuit will be attenuated compared to the amplitude of the LVDS signal reported in the data sheet, since the 400Ω and 100Ω will form a current divider. Only about 80% of the driver current will flow through the 100Ω load, resulting in about a 20% reduction in amplitude.

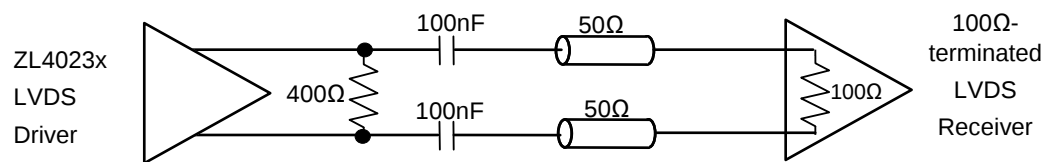


Figure 2 **AC-coupling for Internally Terminated LVDS Receivers**

Note that the circuit in Figure 2 is applicable for signals with frequencies above 1MHz. Lower frequency signals will tend to be further attenuated by the termination network.

E-mail: sales.support@microsemi.com

© 2017 Microsemi Corporation. All rights reserved. Microsemi and the Microsemi logo are trademarks of Microsemi Corporation. All other trademarks and service marks are the property of their respective owners.

Microsemi Corporation (Nasdaq: MSCC) offers a comprehensive portfolio of semiconductor and system solutions for aerospace & defense, communications, data center and industrial markets. Products include high-performance and radiation-hardened analog mixed-signal integrated circuits, FPGAs, SoCs and ASICs; power management products; timing and synchronization devices and precise time solutions, setting the world's standard for time; voice processing devices; RF solutions; discrete components; enterprise storage and communication solutions, security technologies and scalable anti-tamper products; Ethernet solutions; Power-over-Ethernet ICs and midspans; as well as custom design capabilities and services. Microsemi is headquartered in Aliso Viejo, Calif., and has approximately 4,800 employees globally. Learn more at www.microsemi.com.

Microsemi makes no warranty, representation, or guarantee regarding the information contained herein or the suitability of its products and services for any particular purpose, nor does Microsemi assume any liability whatsoever arising out of the application or use of any product or circuit. The products sold hereunder and any other products sold by Microsemi have been subject to limited testing and should not be used in conjunction with mission-critical equipment or applications. Any performance specifications are believed to be reliable but are not verified, and Buyer must conduct and complete all performance and other testing of the products, alone and together with, or installed in, any end-products. Buyer shall not rely on any data and performance specifications or parameters provided by Microsemi. It is the Buyer's responsibility to independently determine suitability of any products and to test and verify the same. The information provided by Microsemi hereunder is provided "as is, where is" and with all faults, and the entire risk associated with such information is entirely with the Buyer. Microsemi does not grant, explicitly or implicitly, to any party any patent rights, licenses, or any other IP rights, whether with regard to such information itself or anything described by such information. Information provided in this document is provided "AS IS" AND "WITH ALL FAULTS". Microsemi, and Microsemi reserves the right to make any changes to the information in this document or to any products and services at any time without notice.

DPA-862-09.17