

Using an LVDS Receiver with TIA/EIA-422 Data

Application Report

IMPORTANT NOTICE

Texas Instruments and its subsidiaries (TI) reserve the right to make changes to their products or to discontinue any product or service without notice, and advise customers to obtain the latest version of relevant information to verify, before placing orders, that information being relied on is current and complete. All products are sold subject to the terms and conditions of sale supplied at the time of order acknowledgment, including those pertaining to warranty, patent infringement, and limitation of liability.

TI warrants performance of its products to the specifications applicable at the time of sale in accordance with TI's standard warranty. Testing and other quality control techniques are utilized to the extent TI deems necessary to support this warranty. Specific testing of all parameters of each device is not necessarily performed, except those mandated by government requirements.

Customers are responsible for their applications using TI components.

In order to minimize risks associated with the customer's applications, adequate design and operating safeguards must be provided by the customer to minimize inherent or procedural hazards.

TI assumes no liability for applications assistance or customer product design. TI does not warrant or represent that any license, either express or implied, is granted under any patent right, copyright, mask work right, or other intellectual property right of TI covering or relating to any combination, machine, or process in which such products or services might be or are used. TI's publication of information regarding any third party's products or services does not constitute TI's approval, license, warranty or endorsement thereof.

Reproduction of information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations and notices. Representation or reproduction of this information with alteration voids all warranties provided for an associated TI product or service, is an unfair and deceptive business practice, and TI is not responsible nor liable for any such use.

Resale of TI's products or services with statements different from or beyond the parameters stated by TI for that product or service voids all express and any implied warranties for the associated TI product or service, is an unfair and deceptive business practice, and TI is not responsible nor liable for any such use.

Also see: [Standard Terms and Conditions of Sale for Semiconductor Products](http://www.ti.com/sc/docs/stdterms.htm). www.ti.com/sc/docs/stdterms.htm

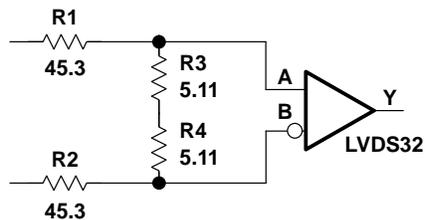
Mailing Address:

Texas Instruments
Post Office Box 655303
Dallas, Texas 75265

Using an LVDS Receiver with TIA/EIA-422 Data

When ground noise between the transmitter and receiver is less than ± 1 V, Figure 1 denotes a circuit that uses a resistor divider circuit in front of the LVDS receiver that attenuates the 422 differential signal to LVDS levels.

The resistors present a total differential load of $100\ \Omega$ to match the characteristic impedance of the transmission line and to reduce the signal by a ratio of 10:1. The high input impedance of the LVDS receiver prevents input bias offsets and maintains a greater than 200 mV differential input voltage threshold at the inputs to the divider (see Note). This circuit is used in front of each LVDS channel that will receive 422 signals.



NOTE: The components used were standard values. The resistor values do not need to be 1% tolerance. The user may find other suppliers with comparable parts having tolerances of 5% or even 10%. These parts are adequate for use in this circuit.

R1, R2 = NRC12F45R3TR, NIC Components, 45.3 Ω , 1/8 W, 1% 1206 Package

R3, R4 = NRC12F5R11TR, NIC Components, 5.11 Ω , 1/8 W, 1% 1206 Package

Figure 1. TIA/EIA-422 Data Input to an LVDS Receiver Under Low Ground-Noise Conditions

If ground noise between the 422 driver and the LVDS receiver is a concern, the common-mode voltage must be attenuated also, and the circuit must be modified to connect the node between R3 and R4 to the LVDS receiver ground. This modification to the circuit increases the common-mode voltage range from ± 1 Vdc to greater than ± 4.5 Vdc. For even more common-mode voltage range. The SN65LVDS32B can be used.

