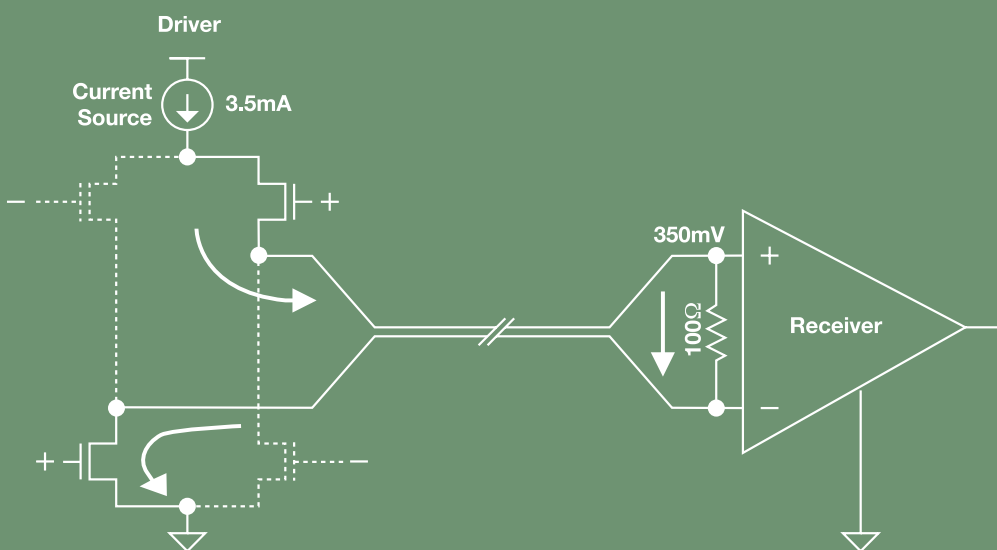


LOW VOLTAGE DIFFERENTIAL SIGNALLING

Low voltage differential signalling, or LVDS, is an electrical signalling system that can run at very high speeds via inexpensive, twisted-pair cables. LVDS combines low power dissipation with high speed.

LVDS is a differential system – it transmits two different voltages that are compared at the receiver. The transmitter injects a small current, nominally 3.5mA, into one wire or the other, depending on the logic level to be sent. At the receiving end, the current passes through a resistor of about 100 to 120 Ω (matched to the impedance of the cable), then returns along the other wire. The current produces a voltage difference across the resistor of about 350mV. The receiver senses the polarity of this voltage to determine the logic level.



The low common-mode voltage (the average of the voltages on the two wires) of about 1.25V allows LVDS to be used with a wide range of integrated circuits with power supply voltages down to 2.5V or lower. The low differential voltage means that LVDS consumes very little power compared to other systems. For example, the static power dissipation in the LVDS load resistor is 1.2mW, compared to the 90mW dissipated by the load resistor for an RS-422 signal.

LVDS is often used for serial data transmission, which involves sending data bit-by-bit down a single wire (as opposed to parallel transmission, in which several bits, usually in multiples of eight, are sent down many wires at once). Its high speed, and its use of in-channel synchronisation, makes it possible to send serial data faster than could be done with a parallel bus, and using fewer wires. When serial data transmission is not fast enough, data can be transmitted in parallel form using an LVDS pair for each bit or even byte. This system is called bus LVDS, or BLVDS.

The ANSI/TIA/EIA-644-A (published in 2001) standard defines LVDS. This recommends a maximum data rate of 655 Mbit/s over twisted-pair copper wire, but predicts a possible speed of over 1.9 Gbit/s for an ideal transmission medium.