HFA1212 Dual Video Buffer Forms Differential Line Driver/Receiver

Application Note | October 1995 | AN9524

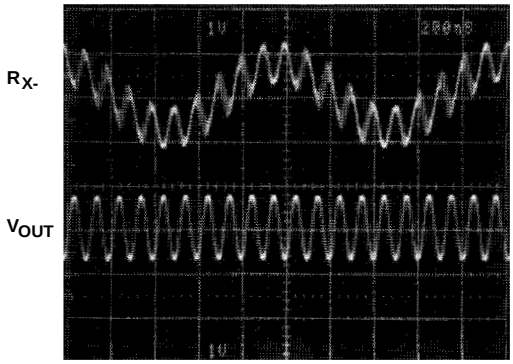
The HFA1212 Dual Video Buffer can be used to implement differential line drivers and receivers with a minimum of external components (see Figure 2). Common mode rejection is set by the internal matched thin film resistors which are pin strapped to set the various closed loop gains that are required.

V_{IN} is terminated into 75Ω and drives both amplifiers in U1. U1A has a gain of -1 while U1B has a gain of +1. These amplifiers create a differential signal with a gain of 2. Series 75Ω resistors provide impedance matching to the transmission line.

The 150Ω termination resistor on the receive side of the transmission line provides proper impedance matching and attenuation for a gain of one at the receive input. U2 performs differential to single ended conversion and provides common mode rejection.

U2A is configured in a gain of +2. U2B subtracts out common mode signals and applies a gain of +2 to differential signals. When V_{OUT} is terminated into 75Ω, the overall gain from V_{IN} to V_{OUT} is unity. Because of the gain of +2 in U2A, the peak voltage at the receiver may not exceed 1.5V.

The oscilloscope photograph illustrates the common mode rejection of the receiver. V_{IN} is a 10MHz, $1.5V_{P-P}$ sine wave. The ground reference of U1 is driven by a 1MHz, $1.5V_{P-P}$ common mode signal. The combined signal, seen on the top trace is measured at R_X-. V_{OUT}, on the bottom trace, is a faithful reproduction of V_{IN} with the common mode signal removed.



V_{IN} = 10MHz, $1.5V_{P-P}$
V_{CM} = 1MHz, $1.5V_{P-P}$ ON GROUND OF U1 WITH RESPECT TO U2

FIGURE 1. COMMON MODE REJECTION

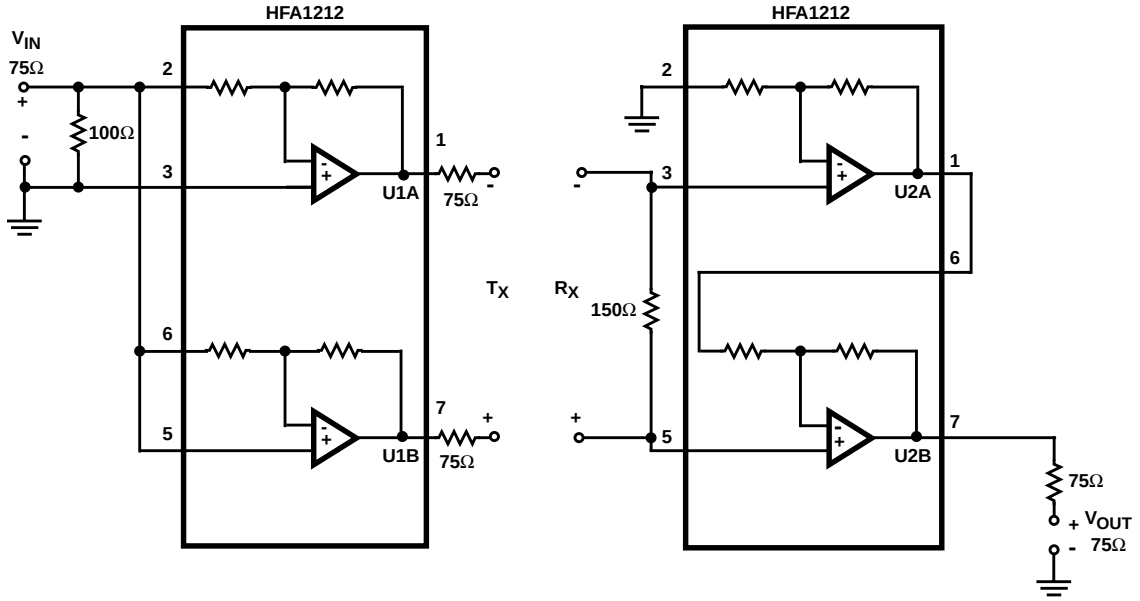


FIGURE 2. DIFFERENTIAL VIDEO LINE DRIVER/RECEIVER

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