

Probing LVDS Signals

Functional Testing Of LVDS Bus Signals Using HPF Probes

Low Voltage Differential Signaling (LVDS) is a high speed, low power general purpose interface standard that offers wide bandwidth along with low transfer error rates. LVDS technology makes use of differential data transmission, for good noise immunity, along with small signal swings, for high speed.

Figure 1 shows an eye diagram of a typical LVDS data signal and one of its associated clocks. This is a quadrature clocked architecture with a data rate in excess of 1.2 GB/s. This data was taken using a LeCroy WavePro 960 coupled with a n HFP 2500 active probe. This probe is single ended with a bandwidth of 2.5 GHz.

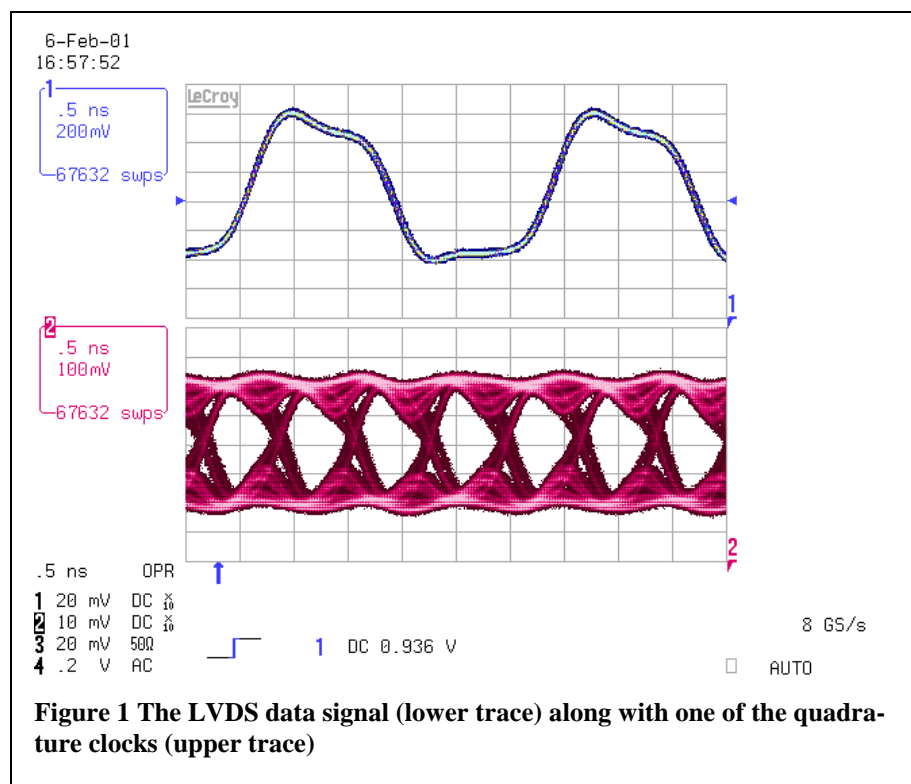


Figure 1 The LVDS data signal (lower trace) along with one of the quadrature clocks (upper trace)

The small probe geometry and interconnection accessories allow good connections with short leads. This can be seen in the waveforms where even though only one side of the differential data components is being measured the noise levels are very low. This allows the WavePro/HFP combination to be used for functional testing of the LVDS components. Figure 2 shows the physical placement of the probes for this measurement.

The 'FreeHand' probe holder permits hands free placement of the



Figure 2 HFP 2500 probe placement using the FreeHand probe holders

probe while maintaining positive contact with the test points.

Probe tip accessories include standard ‘sharp’ points along with three unique specialized probe tips. Figure 3 shows a surface mount device (SMD) tip useful for no-slip probing of surface mount components.

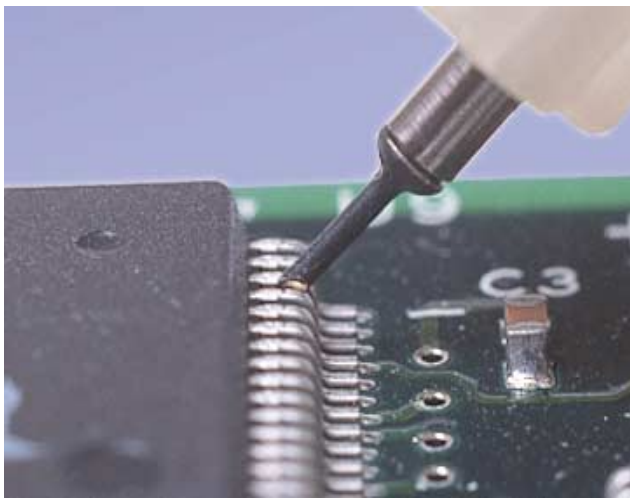


Figure 4 The integrated circuit lead tip

Probing integrated circuit (IC) leads is made safer using the the IC lead tip. This probe tip is insulated on one side and can be inserted between leads for reliable contact with no fear of shorting the leads together.

The bent sharp tip, illustrated in figure 5, provides a way of keeping the probe close to the board under test and probing under obstructions.

The HFP probe tips sockets accept 0.025” (0.635mm) square pins or 0.036” (0.91mm) round pins. This allows the use of the probe with board mounted test points or common ‘pogo’ pins for customized probing needs.

The probe accessories offer a full range of mini-grabbers, flexible wire and offset ground leads to complete the package.

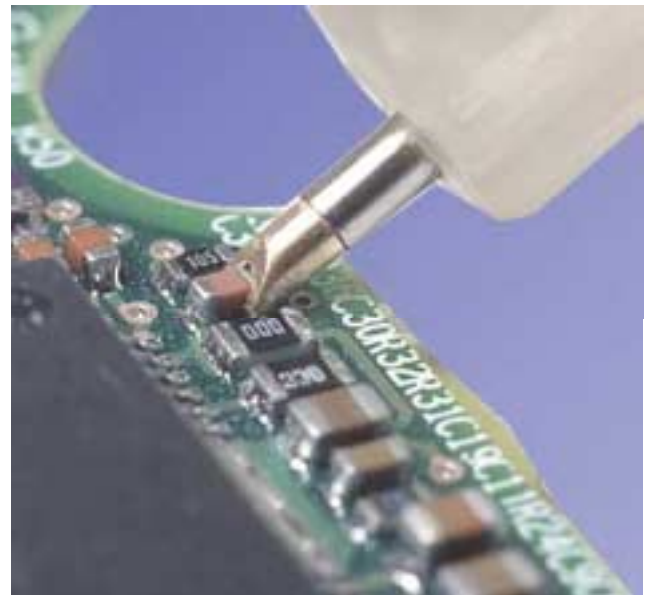


Figure 3 The surface mount device probe tip

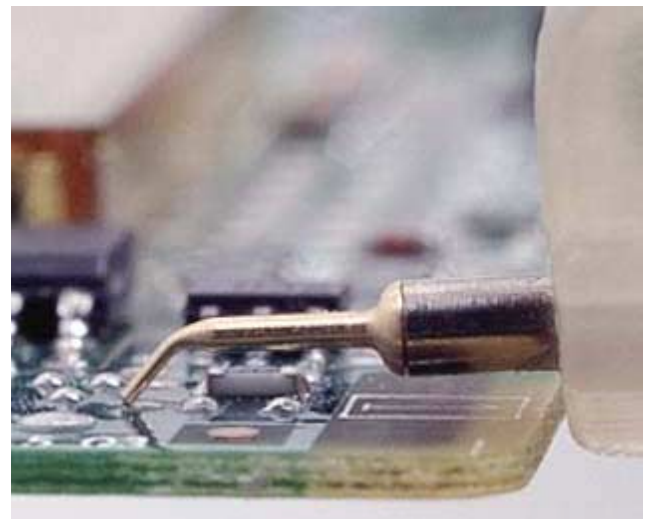


Figure 5 The bent sharp tip

The most noticeable feature of the HFP probes is AutoColor identification. Connect the probe to any input on a LeCroy color scope and the probe lights up in a color to match the input channels default color. This greatly simplifies setup and minimizes the need to disconnect or move probes to see what channel they are connected to.

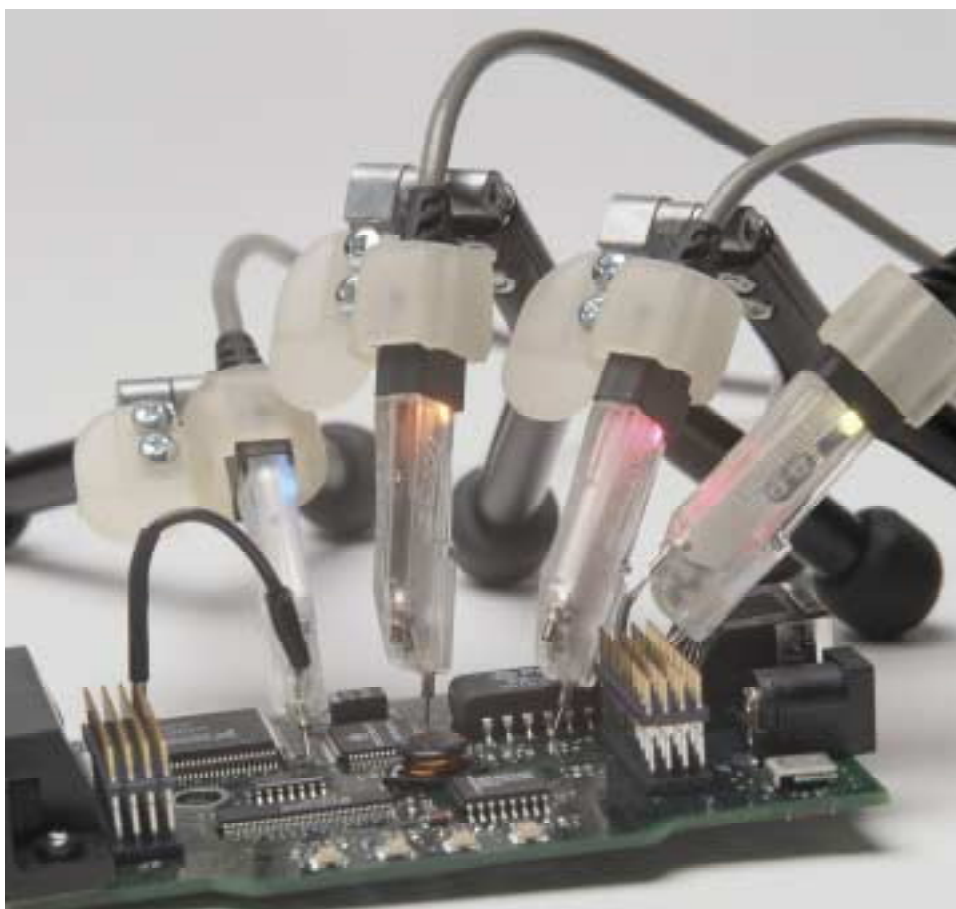


Figure 6 The AutoColor identification feature automatically matches the probe body color to the scope trace color.

The HFP probes are available with bandwidths of 1, 1.5, and 2.5 GHz with input capacitance of less than 0.7 pF and a dynamic range of ± 8 Volts. They are an ideal complement to the WavePro scopes for measuring high frequency waveforms such as these LVDS signals.