Sample/Hold Has Zero Droop and Infinite Hold

Driving a D/A converter with an A/D converter provides an overall analog-hold function which, though limited in output resolution, offers zero voltage droop and infinite hold time (Figure 1). The A/D converter shown (IC1) includes a 12-Bit compatible track/hold at its input. The track/hold specs a 6MHz full-power bandwidth, 30nsec aperture delay, and 50psec aperture jitter.

Control-signal polarities allow the two converters to work together without glue logic: each negative-going transition of the HOLD signal initiates a conversion in IC1, which produces a 12-Bit data word eight microseconds later. The rising edge of HOLD then latches data into the D/A converter. To allow time for A/D conversions, the negative HOLD pulses should be at least 8.5μsec wide.

The voltage reference internal to IC1, which serves both converters, minimizes the parts count and eliminates one source of mismatch in reconstructing sampled voltages. The direct connections shown allow the D/A converter to reconstruct signal levels within the input range 0 to 5V.

(Circle 7)

Figure 1. Direct connections between an A/D converter and a compatible D/A converter provide a simple analog-hold function requiring only three ICs.

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