

FEATURES

- ±10V min Input/Output Range
- 50ns Aperture Delay
- 0.5ns Aperture Jitter
- 6µs Settling Time
- ±0.001% Max Gain Linearity Error
- Complete with Input Buffer

APPLICATIONS

- Track and Hold
- Peak Measurement Systems
- Data Acquisition Systems
- Simultaneous Sample-and-Hold

GENERAL DESCRIPTION

The SHA1144 is a fast sample-and-hold amplifier module with accuracy and dynamic performance appropriate for applications with fast 14-bit A/D converters. In the "sample" mode, it acts as a fast amplifier, tracking the input signal. When switched to the "hold" mode, the output is held at a level corresponding to the input signal voltage at the instant of switching. The droop rate in "hold" is appropriate to allow accurate conversion by 14-bit A/D converters having conversion times of up to 150µs.

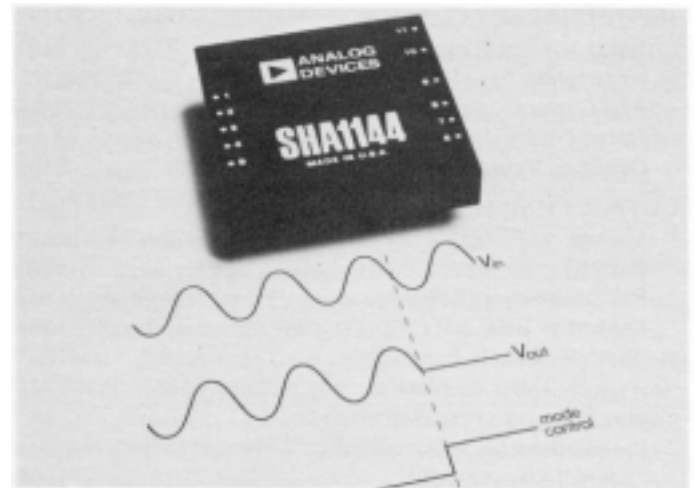
DYNAMIC PERFORMANCE

The SHA1144 was designed to be compatible with fast 14-bit A/D converters such as the ADC1130 and ADC1131 series, which convert 14 bits in 25µs and 12µs, respectively. Maximum acquisition time of 8µs for the SHA1144 permits high sampling rates for 14-bit conversions. The SHA1144 is guaranteed to have a maximum gain nonlinearity of ±0.001% of full scale to insure ½ LSB accuracy in 14-bit systems. When in the "hold" mode, the droop rate is 1µV/µs, so the SHA1144 will hold an input signal to +0.003% of full scale (20V p-p) for over 600µs.

PRINCIPLE OF OPERATION

The SHA1144 consists basically of two high speed operational amplifiers, a storage capacitor, and a digitally controlled switch. It differs from typical sample-and-hold modules in one important respect; application versatility. The user completes the SHA1144 feedback circuit external to the module. Therefore, the module may be used in inverting or noninverting configurations and can easily be arranged to provide circuit gain of more than unity to simplify signal conditioning in a subsystem.

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FEEDBACK CONNECTIONS

A block diagram of the SHA1144 is shown in Figure 1. The input section acts as a voltage-to-current converter, providing the current needed to charge the "hold" capacitor. The output amplifier isolates the "hold" capacitor and provides low output impedance for driving the load. Since feedback is not hardwired in the module, both inverting and noninverting input terminals are available, and the SHA1144 can be connected as a follower with unity gain or potentiometric gain, as well as inverter or even a differential amplifier. Since the unity gain follower mode will be the most frequent application, performance data listed in the specification table is based on this operating mode.

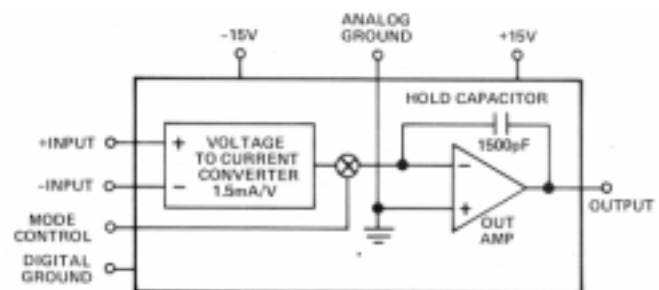


Figure 1. Block Diagram – SH1144