intersil

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Complete, 12-Bit A/D Converters with Microprocessor Interface

The HI-X74(A) is a complete 12-bit, Analog-to-Digital Converter, including a +10V reference clock, three-state outputs and a digital interface for microprocessor control. Successive approximation conversion is performed by two monolithic dice housed in a 28 lead package. The bipolar analog die features the Intersil Dielectric Isolation process, which provides enhanced AC performance and freedom from latch-up.
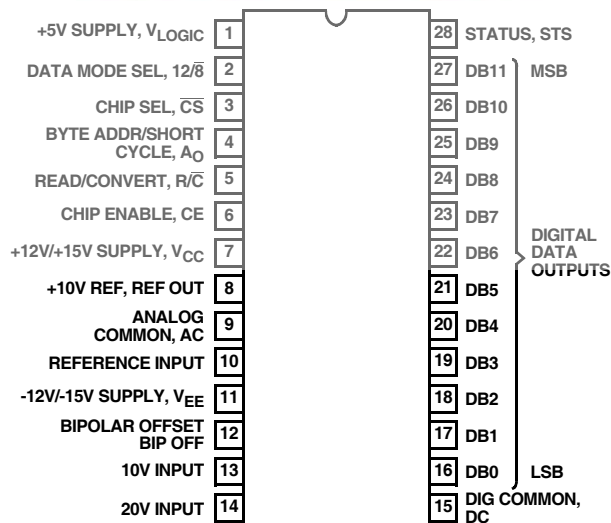
Custom design of each IC (bipolar analog and CMOS digital) has yielded improved performance over existing versions of this converter. The voltage comparator features high PSRR plus a high speed current-mode latch, and provides precise decisions down to 0.1 LSB of input overdrive. More than 2X reduction in noise has been achieved by using current instead of voltage for transmission of all signals between the analog and digital ICs. Also, the clock oscillator is current controlled for excellent stability over temperature.

The HI-X74(A) offers standard unipolar and bipolar input ranges, laser trimmed for specified linearity, gain and offset accuracy. The low noise buried zener reference circuit is trimmed for minimum temperature coefficient.

Power requirements are +5V and ±12V to ±15V, with typical dissipation of 385mW (HI-574A, HI-674A) at 12V.

Features

- Complete 12-Bit A/D Converter with Reference and Clock

- Full 8-Bit, 12-Bit or 16-Bit Microprocessor Bus Interface

- Bus Access Time 150ns

- No Missing Codes Over Temperature

- Minimal Setup Time for Control Signals

- Fast Conversion Times
  - HI-574A (Max) 25µs
  - HI-674A (Max) 15µs

- Low Noise, via Current-Mode Signal Transmission Between Chips

- Byte Enable/Short Cycle (A_O Input)
  - Guaranteed Break-Before-Make Action, Eliminating Bus Contention During Read Operation. Latched by Start Convert Input (To Set the Conversion Length)

- Supply Voltage . . . . ±12V to ±15V

- Pb-Free Available (RoHS Compliant)

Applications

- Military and Industrial Data Acquisition Systems

- Electronic Test and Scientific Instrumentation

- Process Control Systems

Pinout

**HI-574A, HI-674A
(28 LD PDIP, SBDIP)
TOP VIEW**

Pin	Left Signal		Right Signal	Pin
1	+5V SUPPLY, V_{LOGIC}		STATUS, STS	28
2	DATA MODE SEL, 12/$\overline{8}$		DB11 MSB	27
3	CHIP SEL, $\overline{CS}$		DB10	26
4	BYTE ADDR/SHORT CYCLE, A_O		DB9	25
5	READ/CONVERT, R/$\overline{C}$		DB8	24
6	CHIP ENABLE, CE		DB7	23
7	+12V/+15V SUPPLY, V_{CC}		DB6	22
8	+10V REF, REF OUT		DB5	21
9	ANALOG COMMON, AC		DB4	20
10	REFERENCE INPUT		DB3	19
11	-12V/-15V SUPPLY, V_{EE}		DB2	18
12	BIPOLAR OFFSET BIP OFF		DB1	17
13	10V INPUT		DB0 LSB	16
14	20V INPUT		DIG COMMON, DC	15

DIGITAL DATA OUTPUTS

Ordering Information

PART NUMBER	PART MARKING	INL	TEMPERATURE RANGE (°C)	PACKAGE	PKG. DWG. #
HI3-574AJN-5	HI3-574AJN-5	±1.0 LSB	0 to +75	28 Ld PDIP	E28.6
HI3-574AJN-5Z (Notes 1, 3)	HI3-574AJN-5Z	±1.0 LSB	0 to +75	28 Ld PDIP (Pb-Free)	E28.6
HI3-574AKN-5	HI3-574AKN-5	±0.5 LSB	0 to +75	28 Ld PDIP	E28.6
HI3-574AKN-5Z (Notes 1, 3)	HI3-574AKN-5Z	±0.5 LSB	0 to +75	28 Ld PDIP (Pb-Free)	E28.6
HI1-574AJD-5 (Note 2)	HI1-574AJD -5	±1.0 LSB	0 to +75	28 Ld SBDIP (Pb-Free)	D28.6
HI1-574AKD-5 (Note 2)	HI1-574AKD -5	±0.5 LSB	0 to +75	28 Ld SBDIP (Pb-Free)	D28.6
HI1-574ASD-2 (Note 2)	HI1-574ASD -2	±1.0 LSB	-55 to +125	28 Ld SBDIP (Pb-Free)	D28.6
HI1-574ATD-2 (Note 2)	HI1- 574ATD-2	±0.5 LSB	-55 to +125	28 Ld SBDIP (Pb-Free)	D28.6
HI3-674AJN-5	HI3-674AJN-5	±1.0 LSB	0 to +75	28 Ld PDIP	E28.6
HI3-674AJN-5Z (Notes 1, 3)	HI3-674AJN-5Z	±1.0 LSB	0 to +75	28 Ld PDIP (Pb-Free)	E28.6
HI3-674AKN-5	HI3-674AKN-5	±0.5 LSB	0 to +75	28 Ld PDIP	E28.6
HI3-674AKN-5Z (Notes 1, 3)	HI3-674AKN-5Z	±0.5 LSB	0 to +75	28 Ld PDIP (Pb-Free)	E28.6
HI1-674AKD-5 (Note 2)	HI1-674AKD -5	±0.5 LSB	0 to +75	28 Ld SBDIP (Pb-Free)	D28.6
HI1-674ATD/883 (Note 2)	HI1-674ATD /883	±0.5 LSB	-55 to +125	28 Ld SBDIP (Pb-Free)	D28.6

NOTES:

1. Pb-free PDIPs can be used for through hole wave solder processing only. They are not intended for use in Reflow solder processing applications.

2. These Intersil Pb-free Hermetic packaged products employ 100% Au plate - e4 termination finish, which is RoHS compliant and compatible with both SnPb and Pb-free soldering operations.

3. These Intersil Pb-free plastic packaged products employ special Pb-free material sets, molding compounds/die attach materials, and 100% matte tin plate plus anneal (e3 termination finish, which is RoHS compliant and compatible with both SnPb and Pb-free soldering operations). Intersil Pb-free products are MSL classified at Pb-free peak reflow temperatures that meet or exceed the Pb-free requirements of IPC/JEDEC J STD-020.

Functional Block Diagram

NOTE: "Nibble" is a 4-bit digital word.