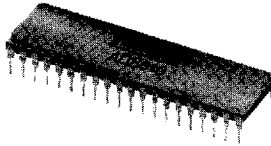


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ADS610

**PRELIMINARY INFORMATION
SUBJECT TO CHANGE
WITHOUT NOTICE**

14-Bit 10MHz Sampling ANALOG-TO-DIGITAL CONVERTER

FEATURES

- **HIGH SPURIOUS-FREE DYNAMIC RANGE:**
90dB AT Nyquist
- **WIDE FULL-POWER BANDWIDTH:**
40MHz
- **HIGH SIGNAL-TO-NOISE RATIO:** 77dB
- **NO MISSING CODES AT 14 BITS**
- **PIN CONSISTENT WITH ADS703, ADS704:**
(16-Bit 2.5MHz, 18-Bit 500kHz)
- **±1.25V ANALOG INPUT RANGE**
- **LOW POWER:** 2.5 Watts
- **SMALL HERMETIC PACKAGE:** 0.6" x 2.0"

APPLICATIONS

- **COMMUNICATIONS SIGNAL PROCESSING**
- **RADAR SIGNAL PROCESSING**
- **CCD IMAGING**
- **MAGNETIC RESONANCE IMAGING**
- **ULTRASOUND SIGNAL PROCESSING**
- **AUTOMATIC TEST EQUIPMENT**
- **HIGH SPEED DATA ACQUISITION**

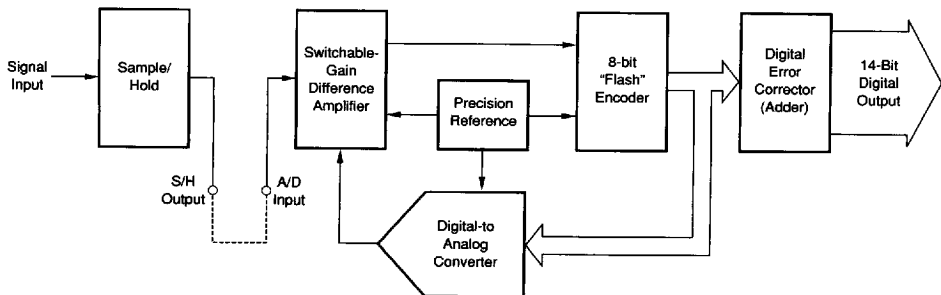
DESCRIPTION

The ADS610 is a very high speed, highly integrated 14-bit sampling A/D converter. It is designed for superior performance and low noise.

The ADS610 is a two-step subranging design containing a quantizer, sample/hold amplifier, voltage reference and timing circuitry in a slim 40-pin package. It is pin consistent with the ADS703 (16-bit 2.5MHz)

and the ADS704 (18-bit 500kHz) sampling ADC's, allowing the user to choose easily between speed and resolution. A convenient TTL-compatible logic interface is provided.

A demonstration board (DEM-ADS610) is available for quick evaluation.



International Airport Industrial Park • Mailing Address: PO Box 11400 • Tucson, AZ 85734 • Street Address: 6730 S. Tucson Blvd. • Tucson, AZ 85706
Tel: (502) 746-1111 • Twx: 910-952-1111 • Cable: BBRCORP • Telex: 066-6491 • FAX: (502) 889-1510 • Immediate Product Info: (800) 548-6132

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ADS610

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A/D CONVERTERS, DATA ACQUISITION COMPONENTS

PARAMETER	CONDITIONS	TEMPERATURE	ADS610H			ADS610HB			UNITS
			MIN	TYP	MAX	MIN	TYP	MAX	
RESOLUTION					14			*	Bits
TEMPERATURE RANGE: H, HB	T _{AMBIENT}		−40		+70	*		*	°C
ANALOG INPUT Full Scale Input Range Input Impedance			−1.25	0.3 x 10 ¹² 2	+1.25	*	*	*	V Ω pF
DIGITAL INPUTS Logic Family Convert Command Pulse Width	Start Conversion t = Conversion Period		TTL/HCT Compatible Convert Command Rising Edge 10			*	*	*	ns
CONVERSION CHARACTERISTICS Sample Rate Data Latency			DC	1	10M	*	*	*	Samples/s Convert Cycle
DC ACCURACY Gain Error Input Offset Power Supply Rejection	Delta +V _S = 5% Delta −V _S = 5%	+25°C Full +25°C Full Full		0.3 0.4 ±0.03 ±0.01	0.7 0.7 ±0.07 ±0.07		0.2 0.2 * *	0.5 0.5 * *	% FSR ppm/°C % FSR ppm/°C % FSR/% % FSR/%
DYNAMIC CHARACTERISTICS No Missing Codes Differential Linearity Error f = 8kHz f = 5MHz Integral Linearity Error Spurious Free Dynamic Range (SFDR) f = 8kHz (−1dBFS Input) f = 5.0MHz (−1dBFS Input) Two-Tone Intermodulation Distortion f = 4.4 and 4.5MHz (−7dB each tone) Signal-to-Noise Ratio (SNR) f = 8kHz (−1dBFS Input) f = 5.0MHz (−1dBFS Input)		Full +25°C Full +25°C Full Full +25°C Full Full +25°C Full Full +25°C Full Full +25°C Full Full +25°C Full Full	Guaranteed			Guaranteed			LSB LSB LSB LSB LSB dBFS dBFS dBFS dBFS dBFS dB dB dB dB
SINAD f = 8kHz (−1dBFS Input) f = 5.0MHz (−1dBFS Input) Output Noise Aperture Delay Time Aperture Jitter Analog Input Bandwidth (−3dB) Small Signal Full Power Overload Recovery Time	Input Grounded −20dB Input 0dB Input 2x Full Scale Input	+25°C Full +25°C Full +25°C Full +25°C Full +25°C Full +25°C Full +25°C Full +25°C Full +25°C Full	69 69 69 69 0.6 5 5 120 40 1	75 74 74 74 0.6 5 5 120 40 1		74 74 74 74 * * * * * *	78 77 77 77 * * * * * *		dB dB dB dB LSB _{rms} ps _{rms} MHz MHz μs
OUTPUTS Logic Family Logic Coding Logic Levels Logic "LO" Logic "HI" 3-State Enable/Disable Time	Logic Selectable I _{OL} < 3.2mA I _{OH} < 80μA	Full Full Full	TTL Compatible SOB or COB				*	*	V V ns

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SPECIFICATIONS(Cont)

$T_A = +25^{\circ}\text{C}$, $V_S = +5\text{V}$, $-V_S = -5.2\text{V}$, $\pm 1.25\text{V}$ Input Range, Sampling Rate = 10MHz unless otherwise noted.

PARAMETER	CONDITIONS	TEMPERATURE	ADS610H			ADS610HB			UNITS
			MIN	TYP	MAX	MIN	TYP	MAX	
POWER SUPPLY REQUIREMENTS									
Supply Voltages: +V _S	Operating	Full	+4.75	+5.0	+5.25	*	*	*	V
-V _S		Full	-5.46	-5.2	-4.94	*	*	*	V
Supply Currents: +I _S	Operating	Full		125			*	*	mA
-I _S		Full		375			*	*	mA
Power Consumption		Full		2.5	2.75		*	*	W
θ _{JC}				TBD			TBD		°C/W
θ _{JA}	Still Air			TBD			TBD		°C/W

ABSOLUTE MAXIMUM RATINGS

$+V_S$	+6V
$-V_S$	0.3V to -6V
Logic Inputs	0V to -5.5V
Junction Temperature	+165 $^{\circ}\text{C}$
Storage Temperature	-65 $^{\circ}\text{C}$ to +165 $^{\circ}\text{C}$
Lead Temperature (soldering, 10s)	+300 $^{\circ}\text{C}$

NOTE: Stresses above these ratings may permanently damage the device.

PACKAGING INFORMATION⁽¹⁾

MODEL	PACKAGE	PACKAGE DRAWING NUMBER
ADS610H, HB	40-Pin, 0.6" Wide Hermetic DIP	214

NOTE: (1) For detailed drawing and dimension table, please see end of data sheet, or Appendix D of Burr-Brown IC Data Book.

PIN CONFIGURATION

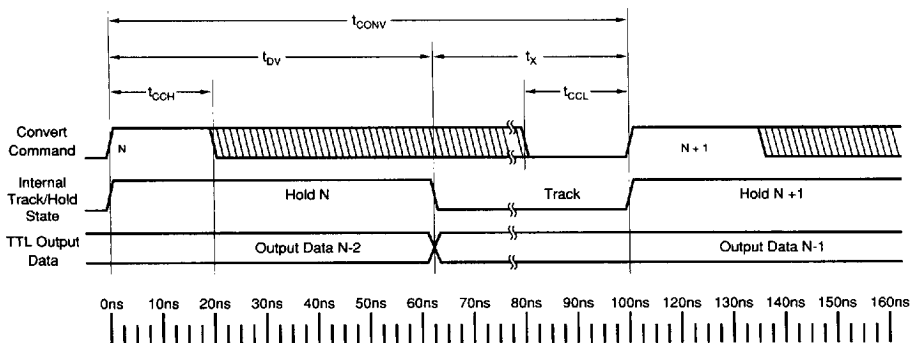
Top View		DIP	
Bit 1	1	40	GND
Bit 2	2	39	Analog Input
Bit 3	3	38	+5V
Bit 4	4	37	GND
Bit 5	5	36	-5V
Bit 6	6	35	Reference Input
Bit 7	7	34	Reference Output
Bit 8	8	33	Ref (Gain) Adjust
Bit 9	9	32	GND
Bit 10	10	31	Offset Adjust
Bit 11	11	30	+5V
Bit 12	12	29	GND
Bit 13	13	28	-5V
Bit 14	14	27	-5V
No Internal Connection	15	26	GND
No Internal Connection	16	25	+5V
No Internal Connection	17	24	Test/Trim Enable
No Internal Connection	18	23	Polarity Control
Over/Underrange	19	22	OUTPUT ENABLE
Convert Command	20	21	GND

ORDERING INFORMATION

Basic Model Number	ADS610	H	()
Package Code			
Performance Grade Code			
No letter or "B" = -40 $^{\circ}\text{C}$ to +70 $^{\circ}\text{C}$ Ambient Temperature			

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TIMING DIAGRAM



SYMBOL	DESCRIPTION	MIN	TYP	MAX	UNITS
t_{COV}	Convert Command Period	100			ns
t_{OH}	Convert Command Pulse Width High	20		$t_{COV} - 20$	ns
t_{OCL}	Convert Command Pulse Width Low	20		$t_{COV} - 20$	ns
t_{OV}	Data Valid After Convert Command	40	63		ns
t_X	Data Valid Before Convert Command	20	37		ns

NOTE: The time scale applies for a 10MHz conversion rate. The "§" indicates the part of timing waveform that will "stretch out" at slower conversion rates.

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