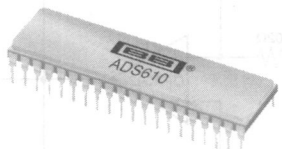
For Immediate Assistance, Contact Your Local Salesperson

BURR-BROWN®



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

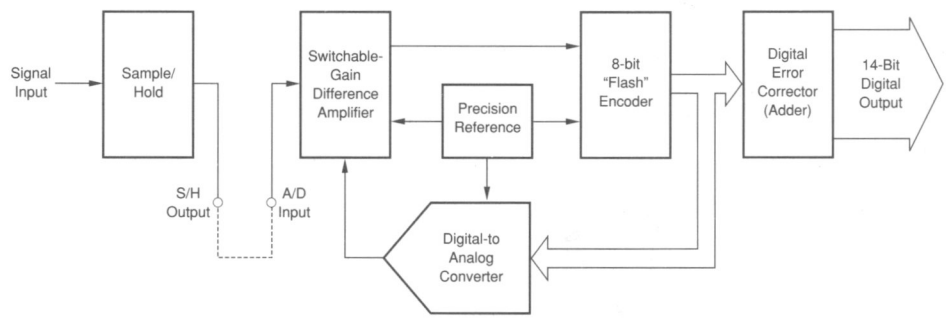
- COMMUNICATIONS SIGNAL PROCESSING
- RADAR SIGNAL PROCESSING
- CCD IMAGING
- MAGNETIC RESONANCE IMAGING
- ULTRASOUND SIGNAL PROCESSING
- AUTOMATIC TEST EQUIPMENT
- HIGH SPEED DATA ACQUISITION

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.



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PDS-1261

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Or, Call Customer Service at 1-800-548-6132 (USA Only)

SPECIFICATIONS

T_A = +25°C, $+V_S$ = +5V, $-V_S$ = –5.2V, ±1.25V Input Range, Sampling Rate = 10MHz unless otherwise noted.

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			–1.25		+1.25	*		*	V
Input Impedance				0.3 x 10^{12} || 2			*		Ω || pF
DIGITAL INPUTS									
Logic Family				TTL/HCT Compatible			*		
Convert Command	Start Conversion			Convert Command Rising Edge			*		
Pulse Width	t = Conversion Period		10		t –20	*		*	ns
CONVERSION CHARACTERISTICS									
Sample Rate			DC		10M	*		*	Samples/s
Data Latency				1			*		Convert Cycle
DC ACCURACY									
Gain Error		+25°C		0.3	0.7		0.2	0.5	% FSR
		Full							ppm/°C
Input Offset		+25°C		0.4	0.7		0.2	0.5	% FSR
		Full							ppm/°C
Power Supply Rejection	Delta $+V_S$ = 5%	Full		±0.03	±0.07		*	*	% FSR/%
	Delta $-V_S$ = 5%	Full		±0.01	±0.07		*	*	% FSR/%
DYNAMIC CHARACTERISTICS									
No Missing Codes		Full		Guaranteed			Guaranteed		
Differential Linearity Error									
f = 8kHz		+25°C		0.8	1.5		0.6	0.8	LSB
		Full		0.8	1.5		0.6	1.0	LSB
f = 5MHz		+25°C		0.9	2.0		0.6	1.0	LSB
		Full		0.9	2.0		0.7	1.0	LSB
Integral Linearity Error		+25°C		0.9	1.5		0.7	1.0	LSB
		Full		1.4	2.0		1.2	1.5	LSB
Spurious Free Dynamic Range (SFDR)									
f = 8kHz (–1dBFS Input)		+25°C	83	87		90	92		dBFS
		Full	82	86		87	91		dBFS
f = 5.0MHz (–1dBFS Input)		+25°C	83	86		90	91		dBFS
		Full	82	85		87	90		dBFS
Two-Tone Intermodulation Distortion									
f = 4.4 and 4.5MHz (–7dB each tone)		+25°C		–86			–91		dBFS
		Full		–85			–90		dBFS
Signal-to-Noise Ratio (SNR)									
f = 8kHz (–1dBFS Input)		+25°C	70	76		75	79		dB
		Full	70	75		75	78		dB
f = 5.0MHz (–1dBFS Input)		+25°C	70	75		75	77		dB
		Full	70	74		75	77		dB
SINAD									
f = 8kHz (–1dBFS Input)		+25°C	69	75		74	78		dB
		Full	69	74		74	77		dB
f = 5.0MHz (–1dBFS Input)		+25°C	69	74		74	77		dB
		Full	69	74		74	77		dB
Output Noise	Input Grounded	+25°C		0.6			*		LSBrms
Aperture Delay Time		+25°C		5			*		ns
Aperture Jitter		+25°C		5			*		ps rms
Analog Input Bandwidth (–3dB)									
Small Signal	–20dB Input	+25°C		120			*		MHz
Full Power	0dB Input	+25°C		40			*		MHz
Overload Recovery Time	2x Full Scale Input	+25°C		1			*		µs
OUTPUTS									
Logic Family				TTL Compatible			*		
Logic Coding	Logic Selectable			SOB or COB			*		
Logic Levels									
Logic "LO"	I_{OL} < 3.2mA	Full	0		0.5	*		*	V
Logic "HI"	I_{OH} < 80µA	Full	4	4.9		*		*	V
3-State Enable/Disable Time		Full		10	25		*	*	ns

SPECIFICATIONS(CONT)

T_A = +25°C, $+V_S$ = +5V, $-V_S$ = –5.2V, ±1.25V Input Range, Sampling Rate = 10MHz unless otherwise noted.

PARAMETER	CONDITIONS	TEMPERATURE	ADS610H MIN	ADS610H TYP	ADS610H MAX	ADS610HB MIN	ADS610HB TYP	ADS610HB MAX	UNITS
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

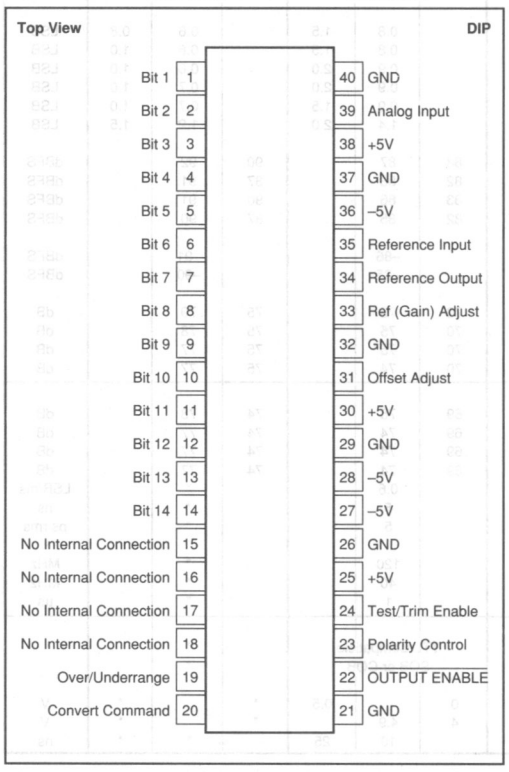
ABSOLUTE MAXIMUM RATINGS

$+V_S$	+6V
$-V_S$	0.3V to –6V
Logic Inputs	0V to –5.5V
Junction Temperature	+165°C
Storage Temperature	–65°C to +165°C
Lead Temperature (soldering, 10s)	+300°C

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

PIN CONFIGURATION

Top View DIP



PACKAGING INFORMATION[1]

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

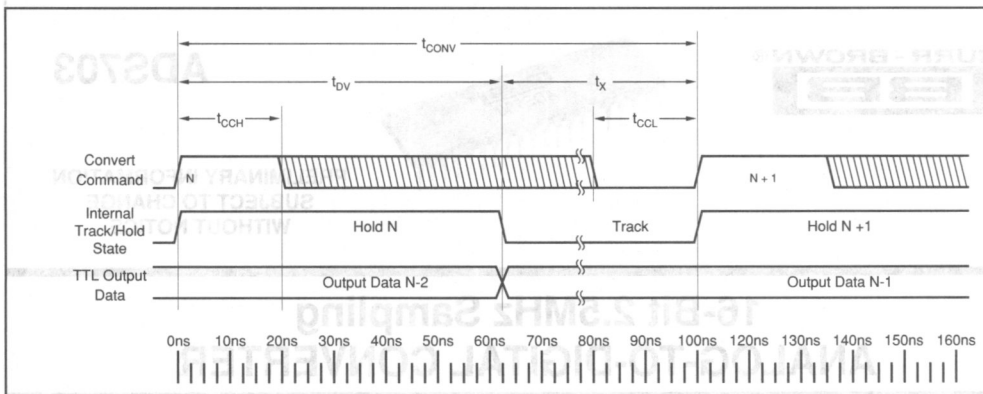
NOTE: (1) For detailed drawing and dimension table, please see end of data sheet, or Appendix D of Burr-Brown IC Data Book.

ORDERING INFORMATION

ADS610 H ( )

Basic Model Number
Package Code
Performance Grade Code
No letter or "B" = –40°C to +70°C Ambient Temperature

TIMING DIAGRAM



SYMBOL	DESCRIPTION	MIN	TYP	MAX	UNITS
t_{CONV}	Convert Command Period	100			ns
t_{CCH}	Convert Command Pulse Width High	20		t_{CONV} –20	ns
t_{CCL}	Convert Command Pulse Width Low	20		t_{CONV} –20	ns
t_{DV}	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.