

For Immediate Assistance, Contact Your Local Salesperson



ADS703

PRELIMINARY INFORMATION
SUBJECT TO CHANGE
WITHOUT NOTICE

16-Bit 2.5MHz Sampling ANALOG-TO-DIGITAL CONVERTER

FEATURES

- HIGH SPURIOUS-FREE DYNAMIC RANGE: 92dB AT 1MHz
- HIGH SNR: 90dB AT 1MHz
- NO MISSING CODES AT 16 BITS
- LOW NONLINEARITY: ± 1 LSB
- PIN CONSISTENT WITH ADS610, ADS704: (14-Bit 10MHz, 18-Bit 500kHz)
- ± 2.5 V ANALOG INPUT RANGE
- LOW POWER: 2.75Watts
- SMALL HERMETIC PACKAGE: 0.6" x 2.0"

APPLICATIONS

- MEDICAL IMAGING
- SPECTRUM ANALYZERS
- IR SPECTROMETERS
- CCD IMAGING
- ULTRASOUND SIGNAL PROCESSING
- SONAR SIGNAL PROCESSING
- AUTOMATIC TEST EQUIPMENT
- HIGH SPEED DATA ACQUISITION

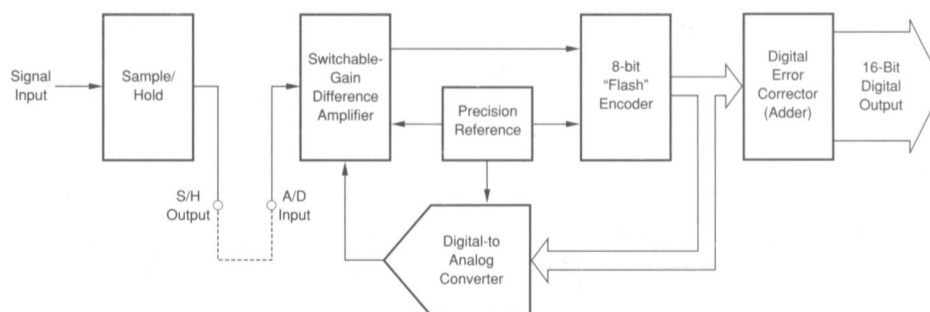
DESCRIPTION

The ADS703 is a very high speed, highly integrated 16-bit sampling A/D converter. It is designed for superior linearity, low noise and wideband spectral performance.

The ADS703 is a three-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 ADS610 (14-bit 10MHz) 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-ADS703) is available for quick evaluation.



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Tel: (602) 746-1111 • Twx: 910-952-1111 • Cable: BBRCORP • Telex: 066-6491 • FAX: (602) 889-1510 • Immediate Product Info: (800) 548-6132



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

SPECIFICATIONS

T_A = +25°C, +V_S = +5V, -V_S = -5.2V, ±2.5V Input Range, Sampling Rate = 2.5MHz unless otherwise noted.

PARAMETER	CONDITIONS	TEMPERATURE	ADS703H			ADS703HB			UNITS
			MIN	TYP	MAX	MIN	TYP	MAX	
RESOLUTION					16				Bits
TEMPERATURE RANGE: H, HB	T _{AMBIENT}		-40		+70	*		*	°C
ANALOG INPUT									
Full Scale Input Range			-2.5		+2.5	*	*	*	V
Input Impedance			0.3 x 10 ¹² 2						Ω pF
DIGITAL INPUTS									
Logic Family			TTL/HCT Compatible						
Start Conversion			Convert Command Rising Edge						
Convert Command Pulse Width	t = Conversion Period		10		t-20	*	*	*	ns
CONVERSION CHARACTERISTICS									
Sample Rate		Full	DC		2.5M	*	*	*	Samples/s
Data Latency				1		*	*	*	Convert Cycle
DC ACCURACY									
Gain Error		+25°C		0.3	0.7		0.2	0.5	% FSR
		Full		0.4	0.7		0.2	0.5	% FSR
Input Offset		+25°C		0.4	0.7		0.2	0.5	% FSR
		Full		0.4	0.7		0.3	0.5	% FSR
Power Supply Rejection	Delta +V _S = 5% Delta -V _S = 5%	Full		±0.03	±0.07		*	*	% FSR/%
		Full		±0.01	±0.07		*	*	% FSR/%
DYNAMIC CHARACTERISTICS									
No Missing Codes		+25°C	Guaranteed			Guaranteed			
		Full	Typical			Guaranteed			
Differential Linearity Error		+25°C		0.8	1.5		0.6	1.0	LSB
f = 8kHz		Full		0.8	1.5		0.7	1.0	LSB
f = 1.0MHz		+25°C		0.9	1.5		0.7	1.0	LSB
		Full		0.9	1.5		0.8	1.0	LSB
Integral Linearity Error		+25°C		0.0025	0.004		0.0015	0.0025	% FSR
f = 8kHz		Full		0.003	0.006		0.002	0.003	% FSR
Spurious Free Dynamic Range (SFDR)		+25°C	88	94		100	102		dBFS
f = 8kHz (-1dBFS Input)		Full	85	92		97	100		dBFS
f = 1.0MHz (-1dBFS Input)		+25°C	85	88		90	92		dBFS
		Full	82	86		87	90		dBFS
Two-Tone Intermodulation Distortion		+25°C		-88			-91		dBFS
f = 1.0 and 1.1MHz (-7dB each tone)		Full		-86			-90		dBFS
Signal-to-Noise Ratio (SNR)		+25°C	86	91		90	93		dB
f = 8kHz (-1dBFS Input)		Full	85	91		89	93		dB
f = 1.0MHz (-1dBFS Input)		+25°C	84	88		87	91		dB
		Full	83	87		86	90		dB
SINAD		+25°C	85	90		89	92		dB
f = 8kHz (-1dBFS Input)		Full	84	90		88	92		dB
f = 1.0MHz (-1dBFS Input)		+25°C	84	89		87	91		dB
		Full	83	88		86	90		dB
Output Noise	Input Grounded	+25°C		1			*		LSBrms
Aperture Delay Time		+25°C		5			*		ns
Aperture Jitter		+25°C		5			*		ps rms
Analog Input Bandwidth (-3dB)		+25°C		30			*		MHz
Small Signal	-20dB Input	+25°C		5			*		MHz
Full Power	0dB Input	+25°C		5			*		MHz
Overload Recovery Time	2x Full Scale Input	+25°C		2			*		μs
OUTPUTS									
Logic Family	Logic Selectable		TTL/HCT Compatible						
Logic Coding			SOB or COB						
Logic Levels		Full	0		0.5	*	*	*	V
Logic "LO"		Full	4	4.9		*	*	*	V
Logic "HI"		Full		10	25	*	*	*	ns
3-State Enable/Disable Time									

ADS703

A/D CONVERTERS, DATA ACQUISITION COMPONENTS



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SPECIFICATIONS(Cont)

T_A = +25°C, +V_S = +5V, -V_S = -5.2V, ±2.5V Input Range, Sampling Rate = 2.5MHz unless otherwise noted.

PARAMETER	CONDITIONS	TEMPERATURE	ADS703H			ADS703HB			UNITS
			MIN	TYP	MAX	MIN	TYP	MAX	
POWER SUPPLY REQUIREMENTS	Operating	Full	+4.75	+5.0	+5.25	*	*	*	V
			-5.46	-5.2	-4.94	*	*	*	V
Supply Currents: +I _S	Operating	Full		200					mA
		Full		300					mA
		Full		2.75	2.9				W
Power Consumption			TBD					°C/W	
θ _{JC}	Still Air		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.

PACKAGING INFORMATION(1)

MODEL	PACKAGE	PACKAGE DRAWING NUMBER
ADS703H, HB	40-Pin, 0.5" 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

ADS703 H ()

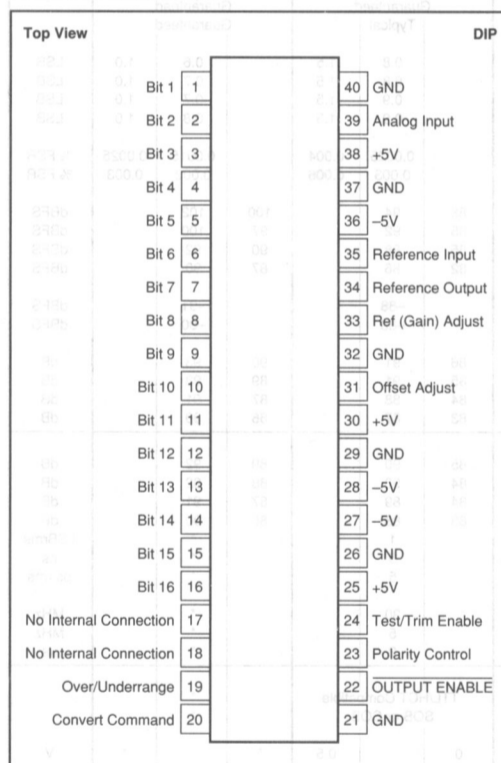
Basic Model Number _____

Package Code _____

Performance Grade Code _____

No letter or "B" = -40°C to +70°C Ambient Temperature

PIN CONFIGURATION



ELECTROSTATIC DISCHARGE SENSITIVITY

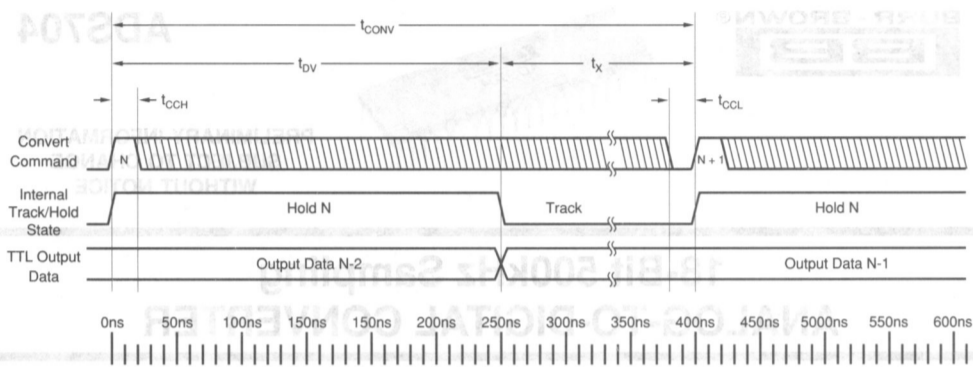
This integrated circuit can be damaged by ESD. Burr-Brown recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage.

ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

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TIMING DIAGRAM



SYMBOL	DESCRIPTION	MIN	TYP	MAX	UNITS
t_{CONV}	Convert Command Period	400			ns
t_{DV}	Data Valid After Convert Command	200	250		ns
t_X	Data Valid Time Before Convert Command	50	150		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

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

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A/D CONVERTERS, DATA ACQUISITION COMPONENTS

