Rochester Electronics

Datasheet

Rochester Electronics Manufactured Components

Rochester branded components are manufactured using either die/wafers purchased from the original suppliers or Rochester wafers recreated from the original IP. All recreations are done with the approval of the OCM.

Parts are tested using original factory test programs or Rochester developed test solutions to guarantee product meets or exceed the OCM data sheet.

Quality Overview

- ISO-9001
- AS9120 certification
- Qualified Manufacturers List (QML) MIL-PRF-35835
    - Class Q Military
    - Class V Space Level
- Qualified Suppliers List of Distributors (QSLD)

    - Rochester is a critical supplier to DLA and meets all industry and DLA standards.

Rochester Electronics, LLC is committed to supplying products that satisfy customer expectations for quality and are equal to those originally supplied by industry manufacturers.

The original manufacturer's datasheet accompanying this document reflects the performance and specifications of the Rochester manufactured version of this device. Rochester Electronics guarantees the performance of its semiconductor products to the original OEM specifications. 'Typical' values are for reference purposes only. Certain minimum or maximum ratings may be based on product characterization, design, simulation, or sample testing.

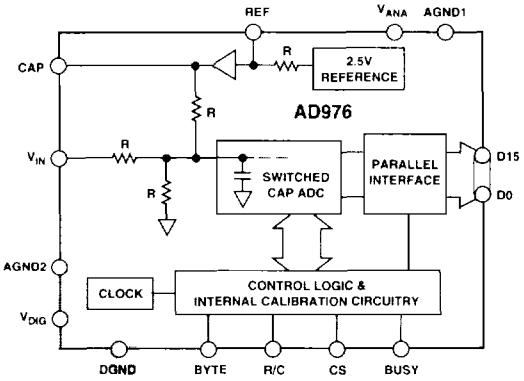
16-Bit, 200 kSPS BiCMOS A/D Converter

AD976

FEATURES

Fast 16-Bit ADC with 200 kSPS Throughput
Single 5 V Supply Operation
Input Range: ±10 V
100 mW Max Power Dissipation
Choice of External or Internal 2.5 V Reference
High Speed Parallel Interface
On-Chip Clock
28-Pin Skinny DIP, SOIC or SSOP Packages

FUNCTIONAL BLOCK DIAGRAM



GENERAL DESCRIPTION

The AD976 is a high speed, low power 16-bit A/D converter that operates from a single 5 V supply. The part contains a successive approximation, switched capacitor ADC, an internal 2.5 V reference, and a high speed parallel interface. The ADC is factory calibrated to minimize all linearity errors. The analog full scale input is the standard industrial range of ±10 V.

The AD976 is comprehensively tested for ac parameters such as SNR and THD, as well as the more traditional parameters of offset, gain, and linearity.

The AD976 is fabricated on Analog Devices' BiCMOS process which has high performance bipolar devices along with CMOS transistors.

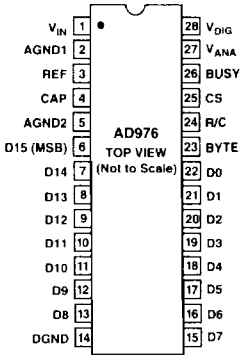
The AD976 is available in skinny 28-pin DIP, SOIC, and SSOP packages.

PRODUCT HIGHLIGHTS

1. Fast 200 kSPS Throughput.
   The AD976 is a high speed, 16-bit ADC based on aswitched capacitor architecture which is factory calibrated.
2. Single-Supply Operation.
   The AD976 operates from a single 5 V supply and dissipates only 100 mW max.
3. Comprehensive DC and AC Specifications.
   As well as the traditional specifications of offset, gain, and linearity, the AD976 is fully tested for SNR and THD.
4. Complete A/D Solution.
   The AD976 offers a highly integrated solution containing an accurate A/D, reference and on-chip clock.

PIN CONFIGURATION

DIP, SOIC and SSOP Packages



AD976–SPECIFICATIONS (T_{MIN} to T_{MAX}, F_S = 200 kHz, V_{DIG} = +5 V ± 10%, V_{ANA} = +5 V ± 5% unless otherwise noted)

Parameter	Conditions	AD976A Min	AD976A Typ	AD976A Max	AD976B Min	AD976B Typ	AD976B Max	Units
RESOLUTION		16			16			Bits
ANALOG INPUT								
Voltage Range			±10			±10		V
Impedance			23			23		kΩ
Capacitance			35			35		pF
THROUGHPUT SPEED								
Conversion Time			3.2	3.5		3.2	3.5	µs
Complete Cycle				5			5	µs
Throughput Rate		200			200			kHz
DC ACCURACY								
Integral Linearity Error				±3			±1.5	LSB[1]
Differential Linearity Error				+3, −2			+1.5, −1	LSB
No Missing Codes		15			16			Bits
Transition Noise[2]			1.3			1.3		LSB
Full-Scale Error[3, 4]				±0.50			±0.25	%
Full-Scale Error Drift			±7			±5		ppm/°C
Full-Scale Error	Ext REF = 2.5 V			±0.50			±0.25	%
Full-Scale Error Drift	Ext REF = 2.5 V		±2			±2		ppm/°C
Bipolar Zero Error[3]				±10			±10	mV
Bipolar Zero Error Drift			±2			±2		ppm/°C
Power Supply Sensitivity								
$V_{ANA} = V_{DIG} = V_D$	V_D = 5 V ± 5%			±8			±8	LSB
V_{DIG} = 5 V ± 10%	V_{ANA} = 5 V		TBD			TBD		LSB
AC ACCURACY								
Spurious Free Dynamic Range	f_{IN} = 45 kHz	90			96			dB[5]
Total Harmonic Distortion	f_{IN} = 45 kHz			90			96	dB
Signal-to-(Noise+Distortion)	f_{IN} = 45 kHz	83			86			dB
	60 dB Input		30			32		
Signal-to-Noise	f_{IN} = 45 kHz	83			86			dB
Full Power Bandwidth[6]			250			250		kHz
SAMPLING DYNAMICS								
Aperture Delay			40			40		ns
Aperture Jitter				Sufficient to Meet AC Specs				
Transient Response	Full-Scale Step			2			2	µs
Over Voltage Recovery[7]			150			150		ns
REFERENCE								
Internal Reference Voltage		2.48	2.5	2.52	2.48	2.5	2.52	V
Internal Reference Source Current			1			1		µA
External Reference Voltage Range for Specified Linearity		2.3	2.5	2.7	2.3	2.5	2.7	V
External Reference Current Drain	Ext REF = 2.5 V			100			100	µA
DIGITAL INPUTS								
Logic Levels								
V_{IL}		0.3		+0.8	0.3		+0.8	V
V_{IH}		+2.0		V_{DIG} + 0.3	+2.0		V_{DIG} + 0.3	V
I_{IL}				±10			±10	µA
I_{IH}				±10			±10	µA

Specifications subject to change without notice.

This information applies to a product under development. Its characteristics and specifications are subject to change without notice. Analog Devices assumes no obligation regarding future manufacture unless otherwise agreed to in writing.