

PRELIMINARY  
Specifications Subject To Change Without Notice

## ADC0801-ADC0804 8-Bit Microprocessor Compatible A/D Converters

### FEATURES

- MCS-48 and MCS-80/85 bus compatible—no interfacing logic required
- Conversion time < 100  $\mu$ s
- Easy interface to all microprocessors
- Will operate "stand alone"
- Differential analog voltage inputs
- Bandgap voltage references
- TTL compatible inputs and outputs
- ON-chip clock generator
- 0V to 5V analog voltage input range (single +5V supply)
- No zero adjust required

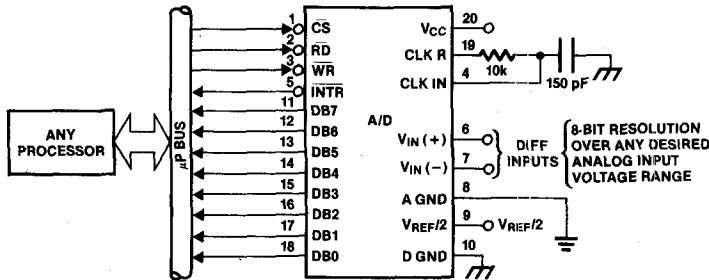
### GENERAL DESCRIPTION

The ADC0801 family are CMOS 8-bit successive approximation A/D converters which use a modified potentiometric ladder, and are designed to operate with the 8080A control bus via three-state outputs. These converters appear to the processor as memory locations or I/O ports, hence no interfacing is required.

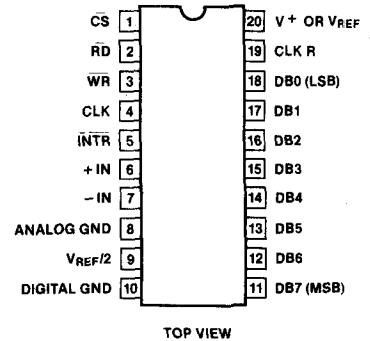
A differential analog voltage input allows increasing the common-mode-rejection and offsetting the analog zero input voltage value. In addition, the voltage reference input can be adjusted to allow encoding any smaller analog voltage span to the full 8 bits of resolution.

The ADC0801 family is available in the industry standard 20 pin Cerdip packages.

### TYPICAL APPLICATION



### PIN CONFIGURATION



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### ORDERING INFORMATION

PART	ERROR	TEMPERATURE RANGE	PACKAGE	ORDER NUMBER
ADC0801	$\pm 1/4$ bit adjusted full scale	0°C to +70°C	20 pin Cerdip	ADC0801LCN
		-40°C to +85°C	20 pin Cerdip	ADC0801LCD
		-55°C to +125°C	20 pin Cerdip	ADC0801LD
ADC0802	$\pm 1/2$ bit no adjust	0°C to +70°C	20 pin Cerdip	ADC0802LCN
		-40°C to +85°C	20 pin Cerdip	ADC0802LCD
		-55°C to +125°C	20 pin Cerdip	ADC0802LD
ADC0803	$\pm 1/2$ bit adjusted full scale	0°C to +70°C	20 pin Cerdip	ADC0803LCN
		-40°C to +85°C	20 pin Cerdip	ADC0803LCD
		-55°C to +125°C	20 pin Cerdip	ADC0803LD
ADC0804	$\pm 1$ bit no adjust	0°C to +70°C	20 pin Cerdip	ADC0804LCN
		-40°C to +85°C	20 pin Cerdip	ADC0804LCD

## ABSOLUTE MAXIMUM RATINGS

Supply Voltage	6.5V
Voltage at Any Input	-0.3V to (V <sup>+</sup> + 0.3V)
Storage Temperature Range	-65°C to +150°C
Package Dissipation at T <sub>A</sub> = 25°C	875 mW
Lead Temperature (Soldering, 10 seconds)	300°C

## OPERATING RATINGS

Temperature Range	-55°C to +125°C
ADC0801/02/03LD	-55°C to +125°C
ADC0801/02/03/04LCD	-40°C to +85°C
ADC0801/02/03/04LCN	0°C to +70°C
Supply Voltage Range	4.5V to 6.5V

## ELECTRICAL CHARACTERISTICS

Converter Specifications: V<sup>+</sup> = 5V, V<sub>REF/2</sub> = 2.500V, T<sub>MIN</sub> ≤ T<sub>A</sub> ≤ T<sub>MAX</sub> and f<sub>c</sub> = 640 kHz unless otherwise stated.

PARAMETER	MIN	TYP	MAX	UNIT	TEST CONDITIONS
ADC0801: Total Adjusted Error			± 1/4	LSB	With Full Scale Adjust
ADC0802: Total Unadjusted Error			± 1/2	LSB	Completely Unadjusted
ADC0803: Total Adjusted Error			± 1/2	LSB	With Full Scale Adjust
ADC0804: Total Unadjusted Error			± 1	LSB	Completely Unadjusted
V <sub>REF/2</sub> Input Resistance	1.0	1.3		kΩ	Input Resistance at Pin 9
Analog Input Voltage Range	GND - 0.05		V <sup>+</sup> + 0.05	V	
DC Common-Mode Rejection		± 1/16	± 1/8	LSB	Over Analog Input Voltage Range
Power Supply Sensitivity		± 1/16	± 1/8	LSB	V <sup>+</sup> = 5V ± 10% Over Allowed Input Voltage Range

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Timing Specifications: V<sup>+</sup> = 5V and T<sub>A</sub> = 25°C unless otherwise stated.

PARAMETER	MIN	TYP	MAX	UNIT	TEST CONDITIONS
f <sub>c</sub> Clock Frequency	100	640	1280	kHz	V <sup>+</sup> = 6V, V <sup>+</sup> = 5V
t <sub>conv</sub> Conversion Time	66	640	800	ns	
CR Conversion Rate In Free-Running Mode			8770	Conv/S	INTR tied to WR with CS = 0V, f <sub>c</sub> = 640 kHz
t <sub>W(WR)L</sub> Width of WR Input (Start Pulse Width)	100			ns	CS = 0V
t <sub>ACC</sub> Access Time (Delay from Falling Edge of RD to Output Data Valid)		135	200	ns	C <sub>L</sub> = 100 pF (Use Bus Driver IC for Larger C <sub>L</sub> )
t <sub>1H</sub> , t <sub>0H</sub> 3-State Control (Delay from Rising Edge of RD to Hi-Z State)		125	250	ns	C <sub>L</sub> = 10 pF, R <sub>L</sub> = 10k
t <sub>WI</sub> Delay from Falling Edge of WR to Reset of INTR		300	450	ns	
C <sub>IN</sub> Input Capacitance of Logic Control Inputs		5	7.5	pF	
C <sub>OUT</sub> 3-State Output Capacitance (Data Buffers)		5	7.5	pF	