

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 μ 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

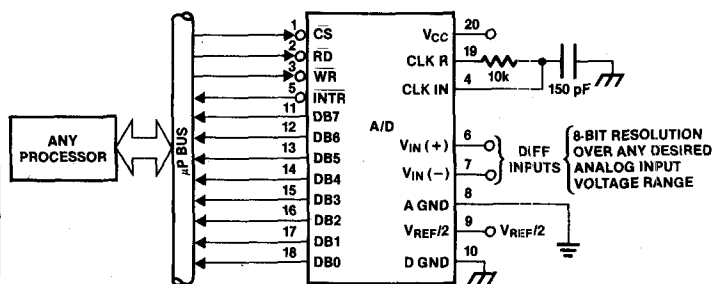
GENERAL DESCRIPTION

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.

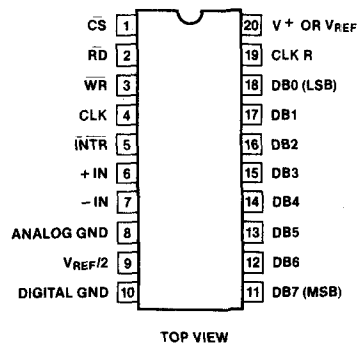
A differential analog voltage input allows increasing the common-mode-rejection and offsetting the analog zero input voltage value. In addition, the voltage reference input can be adjusted to allow encoding any smaller analog voltage span to the full 8 bits of resolution.

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

TYPICAL APPLICATION



PIN CONFIGURATION



ORDERING INFORMATION

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

ABSOLUTE MAXIMUM RATINGS

Supply Voltage 6.5V
 Voltage at Any Input $-0.3V$ to $(V^+ + 0.3V)$
 Storage Temperature Range -65°C to $+150^{\circ}\text{C}$
 Package Dissipation at $T_A = 25^{\circ}\text{C}$ 875 mW
 Lead Temperature (Soldering, 10 seconds) 300°C

OPERATING RATINGS

Temperature Range
 ADC0801/02/03LD -55°C to $+125^{\circ}\text{C}$
 ADC0801/02/03/04LCD -40°C to $+85^{\circ}\text{C}$
 ADC0801/02/03/04LCN 0°C to $+70^{\circ}\text{C}$
 Supply Voltage Range 4.5V to 6.5V

ELECTRICAL CHARACTERISTICS

Converter Specifications: $V^+ = 5V$, $V_{REF}/2 = 2.500V$, $T_{MIN} \leq T_A \leq T_{MAX}$ and $f_c = 640$ kHz unless otherwise stated.

PARAMETER	MIN	TYP	MAX	UNIT	TEST CONDITIONS
ADC0801: Total Adjusted Error			$\pm 1/4$	LSB	With Full Scale Adjust
ADC0802: Total Unadjusted Error			$\pm 1/2$	LSB	Completely Unadjusted
ADC0803: Total Adjusted Error			$\pm 1/2$	LSB	With Full Scale Adjust
ADC0804: Total Unadjusted Error			± 1	LSB	Completely Unadjusted
$V_{REF}/2$ Input Resistance	1.0	1.3		k Ω	Input Resistance at Pin 9
Analog Input Voltage Range	GND – 0.05		$V^+ + 0.05$	V	
DC Common-Mode Rejection		$\pm 1/16$	$\pm 1/8$	LSB	Over Analog Input Voltage Range
Power Supply Sensitivity		$\pm 1/16$	$\pm 1/8$	LSB	$V^+ = 5V \pm 10\%$ Over Allowed Input Voltage Range

Timing Specifications: $V^+ = 5V$ and $T_A = 25^{\circ}\text{C}$ unless otherwise stated.

PARAMETER	MIN	TYP	MAX	UNIT	TEST CONDITIONS
f_c Clock Frequency	100 100	640 640	1280 800	kHz kHz	$V^+ = 6V$, $V^+ = 5V$
t_{conv} Conversion Time	66		73	ns	
CR Conversion Rate In Free-Running Mode			8770	Conv/S	$\overline{INTR}$ tied to $\overline{WR}$ with $\overline{CS} = 0V$, $f_c = 640$ kHz
$t_{W(\overline{WR})L}$ Width of $\overline{WR}$ Input (Start Pulse Width)	100			ns	$\overline{CS} = 0V$
t_{ACC} Access Time (Delay from Falling Edge of $\overline{RD}$ to Output Data Valid)		135	200	ns	$C_L = 100$ pF (Use Bus Driver IC for Larger C_L)
t_{1H}, t_{0H} 3-State Control (Delay from Rising Edge of $\overline{RD}$ to Hi-Z State)		125	250	ns	$C_L = 10$ pF, $R_L = 10k$
t_{WI} Delay from Falling Edge of $\overline{WR}$ to Reset of $\overline{INTR}$		300	450	ns	
C_{IN} Input Capacitance of Logic Control Inputs		5	7.5	pF	
C_{OUT} 3-State Output Capacitance (Data Buffers)		5	7.5	pF	