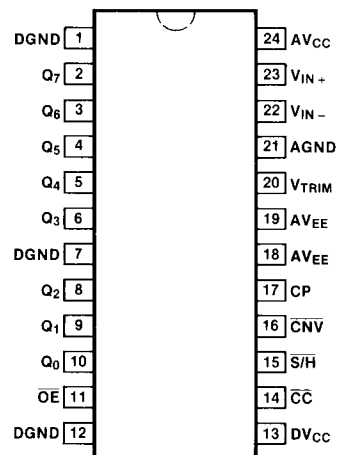


54F/74F505

8-Bit Successive Approximation Analog-to-Digital Converter

- Microprocessor Compatible
- Conversion Time 100 ns Typ
- Power Dissipation 450 mW Typ
- + 5 V and - 5 V Power Supplies
- Input Range + 1 V to - 1 V
- Linearity ± 0.5 LSB
- Output Code Offset Binary (+ 1 V = 1111111, - 1 V = 00000000)
- On Chip Temperature Stable Reference Voltage
- User Gain Trim
- 3-State Latched Outputs

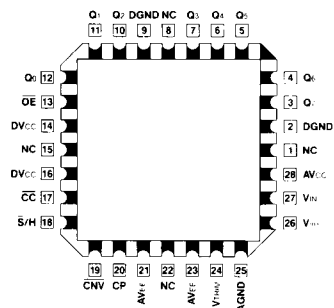
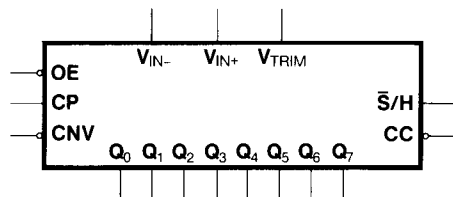
Connection Diagrams



Pin Assignment
for DIP and SOIC

Ordering Code: See Section 5

Logic Symbol

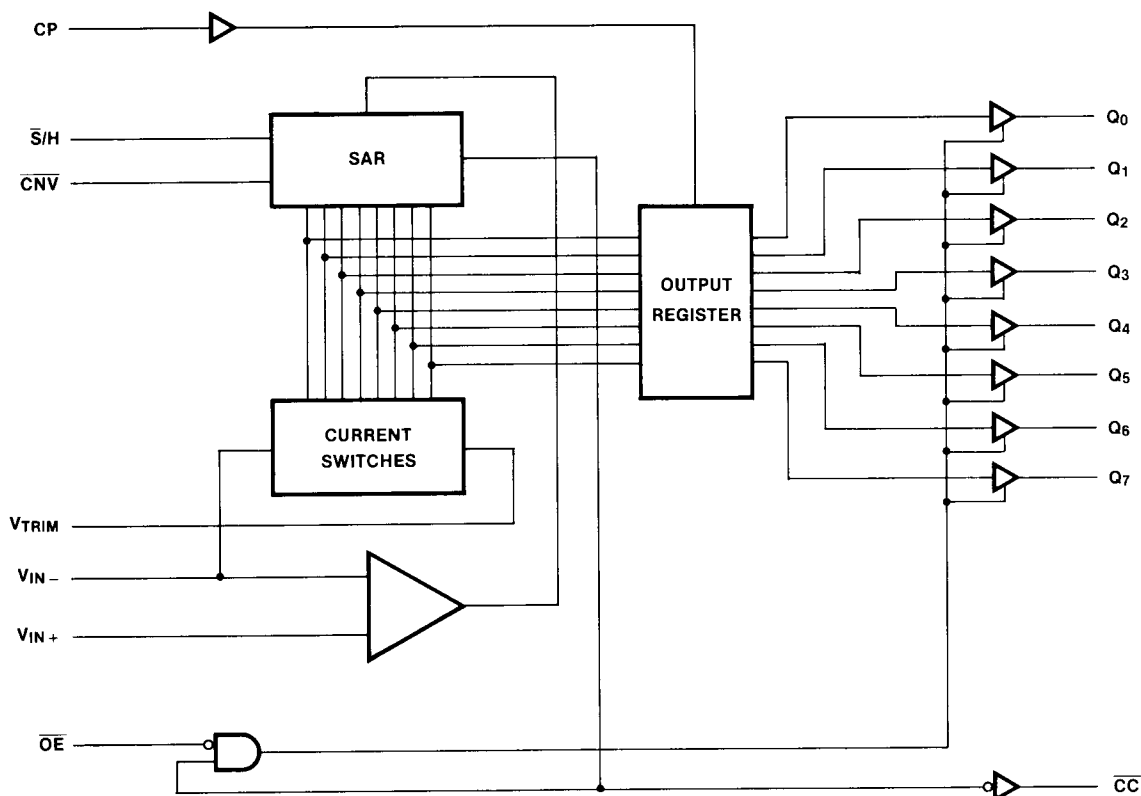


Pin Assignment
for LCC and PCC

Input Loading/Fan-Out: See Section 3 for U.L. definitions

Pin Names	Description	54F/74F(U.L.) HIGH/LOW
AV _{CC}	Analog +5 V Supply Voltage	N/A
A _{GND}	Analog 0 V	N/A
AV _{EE}	Analog -5 V Supply Voltage	N/A
DV _{CC}	Digital +5 V Supply Voltage	N/A
D _{GND}	Digital 0 V	N/A
V _{IN} +	Analog Input +	N/A
V _{IN} -	Analog Input -	N/A
V _{TRIM}	Gain Trim	N/A
$\overline{S/H}$	Sample/Hold	0.5/0.375
$\overline{CNV}$	Convert	0.5/0.375
$\overline{CC}$	Conversion Complete	25/12.5
$\overline{OE}$	Output Enable	0.5/0.375
Q ₀ -Q ₇	Data Out	75/15 (12.5)
CP	Clock	0.5/0.375

Block Diagram



Functional Description

The 'F505 is a high-speed, 8-bit successive approximation analog to digital converter. It is intended for use up to video frequencies, and where the speed of flash converters is not required. It features a unique handshaking control system which allows a simple microprocessor interface and simple cascading for interleaved operation.

Performance Characteristics over Recommended Operating Temperature Range

Parameter	54F/74F			Units
	Min	Typ	Max	
Conversion Time	100			ns
Resolution	8			Bits
Input Range	- 1.0		+ 1.0	V
Linearity	- 0.5		+ 0.5	LSB
Differential Linearity			0.2	%
Gain Temperature Coefficient			20	ppm/°C
Common Mode Offset	- 1.0		+ 1.0	V

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Interface Specifications Over Recommended Operating Temperature Range

Power Supply

Symbol	Parameter	54F/74F			Units
		T _A = + 25°C V _{CC} (TTL) = + 5.0 V V _{CC} (Analog) = + 5.0 V V _{EE} (Analog) = -5.0 V C _L = 50 pF			
		Min	Typ	Max	
I _{CCD}	Supply Current TTL V _{CC} to TTL Gnd			50	mA
I _{CCA}	Supply Current Analog V _{CC} to Analog Gnd			28	mA
I _{EE}	Supply Current Analog Gnd to Analog V _{EE}			41	mA

Interface Specifications Over Recommended Operating Temperature Range (cont'd)

Analog

Symbol	Parameter	54F/74F			Units
		$T_A = +25^{\circ}\text{C}$ $V_{CC} \text{ (TTL)} = +5.0 \text{ V}$ $V_{CC} \text{ (Analog)} = +5.0 \text{ V}$ $V_{EE} \text{ (Analog)} = -5.0 \text{ V}$ $C_L = 50 \text{ pF}$			
		Min	Typ	Max	
Signal Input:					
V_{IN}	Input Voltage	- 1.0		+ 1.0	V
R_{IN}	Input Resistance		20		K Ω
C_{IN}	Input Capacitance			10	pF
I_{BIAS}	Input Bias Current ($V_{IN} + = \text{Max}$)			430	μA
Trim Input:					
V_{TRIM}	Trim Input Range	- 0.825		+ 0.825	V
V_{TRIM} (center)	Trim Input Center Voltage Trim Range		3.89 2.00		V %fsd
R_{TRIM}	Input Resistance	5.8			K Ω

AC Characteristics

Symbol	Parameter	54F/74F			54F		74F		Units
		$T_A = +25^{\circ}\text{C}$ $V_{CC} \text{ (TTL)} = +5.0 \text{ V}$ $V_{CC} \text{ (Analog)} = +5.0 \text{ V}$ $V_{EE} \text{ (Analog)} = -5.0 \text{ V}$ $C_L = 50 \text{ pF}$			$T_A = -55^{\circ}\text{C to } +125^{\circ}\text{C}$ $V_{CC} \text{ (TTL)} = +5.0 \text{ V} \pm 10\%$ $V_{CC} \text{ (Analog)} = +5.0 \text{ V} \pm 10\%$ $V_{EE} \text{ (Analog)} = -5.0 \text{ V} \pm 10\%$ $C_L = 50 \text{ pF}$		$T_A = 0^{\circ}\text{C to } +70^{\circ}\text{C}$ $V_{CC} \text{ (TTL)} = +5.0 \text{ V} \pm 5\%$ $V_{CC} \text{ (Analog)} = +5.0 \text{ V} \pm 5\%$ $V_{EE} \text{ (Analog)} = -5.0 \text{ V} \pm 5\%$ $C_L = 50 \text{ pF}$		
		Min	Typ	Max	Min	Max	Min	Max	
f_{max}	Maximum Clock Frequency	80							MHz
t_{PLH} t_{PHL}	Propagation Delay Digital Output	8.0 8.0							ns

AC Operating Requirements

Symbol	Parameter	54F/74F			54F		74F		Units
		$T_A = +25^{\circ}\text{C}$ $V_{CC} \text{ (TTL)} = +5.0 \text{ V}$ $V_{CC} \text{ (Analog)} = +5.0 \text{ V}$ $V_{EE} \text{ (Analog)} = -5.0 \text{ V}$ $C_L = 50 \text{ pF}$			$T_A = -55^{\circ}\text{C to } +125^{\circ}\text{C}$ $V_{CC} \text{ (TTL)} = +5.0 \text{ V} \pm 10\%$ $V_{CC} \text{ (Analog)} = +5.0 \text{ V} \pm 10\%$ $V_{EE} \text{ (Analog)} = -5.0 \text{ V} \pm 10\%$ $C_L = 50 \text{ pF}$		$T_A = 0^{\circ}\text{C to } +70^{\circ}\text{C}$ $V_{CC} \text{ (TTL)} = +5.0 \text{ V} \pm 5\%$ $V_{CC} \text{ (Analog)} = +5.0 \text{ V} \pm 5\%$ $V_{EE} \text{ (Analog)} = -5.0 \text{ V} \pm 5\%$ $C_L = 50 \text{ pF}$		
		Min	Typ	Max	Min	Max	Min	Max	
$t_s(\text{H})$ $t_s(\text{L})$	Setup Time, HIGH or LOW CNV to CP		2.0 2.0						ns
$t_h(\text{H})$ $t_h(\text{L})$	Hold Time HIGH or LOW CNV to CP		2.0 2.0						ns
$t_w(\text{H})$ $t_w(\text{L})$	Clock Pulse Width HIGH or LOW		4.4 4.4						ns

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Fig. 505-a Timing Waveforms

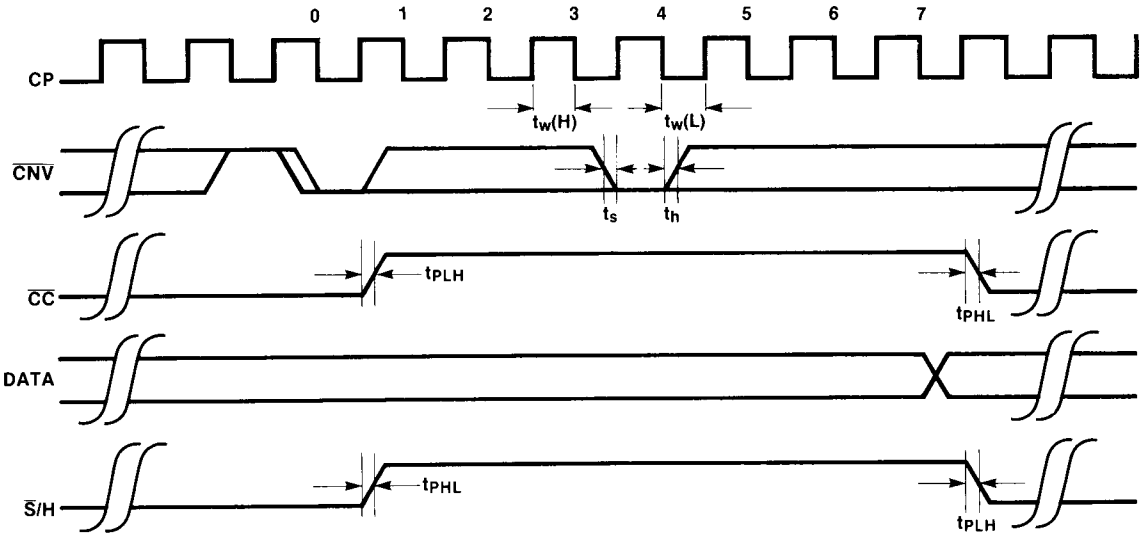


Fig. 505-b Timing Waveforms

