54AC/74AC520 • 54ACT/74ACT520
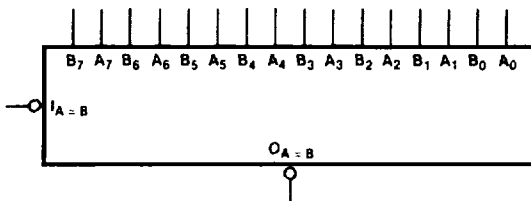## 54AC/74AC521 • 54ACT/74ACT521

8-Bit Identity Comparator

Description

The 'AC/'ACT520/521 are expandable 8-bit comparators. They compare two words of up to eight bits each and provide a LOW output when the two words match bit for bit. The expansion input $\overline{I}_{A=B}$ also serves as an active LOW enable input. The '521 features a pull-up resistor on each input.

- **Compares Two 8-Bit Words in 6.5 ns Typ**
- **Expandable to Any Word Length**
- **20-Pin Package**
- **Outputs Source/Sink 24 mA**
- **'521 has Input Pull-Up Resistors**
- **'ACT520 and 'ACT521 have TTL-Compatible Inputs**
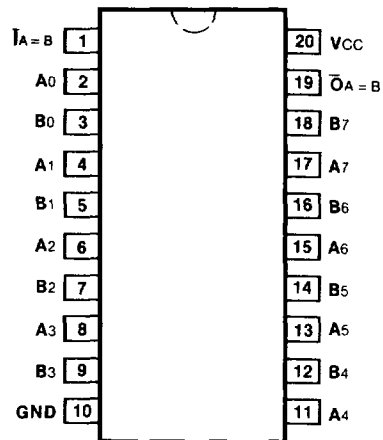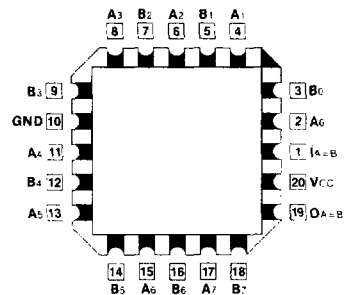
Ordering Code: See Section 6

Logic Symbol

Pin Names

$A_0 - A_7$	Word A Inputs
$B_0 - B_7$	Word B Inputs
$\overline{I}_{A=B}$	Expansion or Enable Input
$\overline{O}_{A=B}$	Identity Output

Connection Diagrams

**Pin Assignment
for DIP, Flatpak and SOIC**

**Pin Assignment
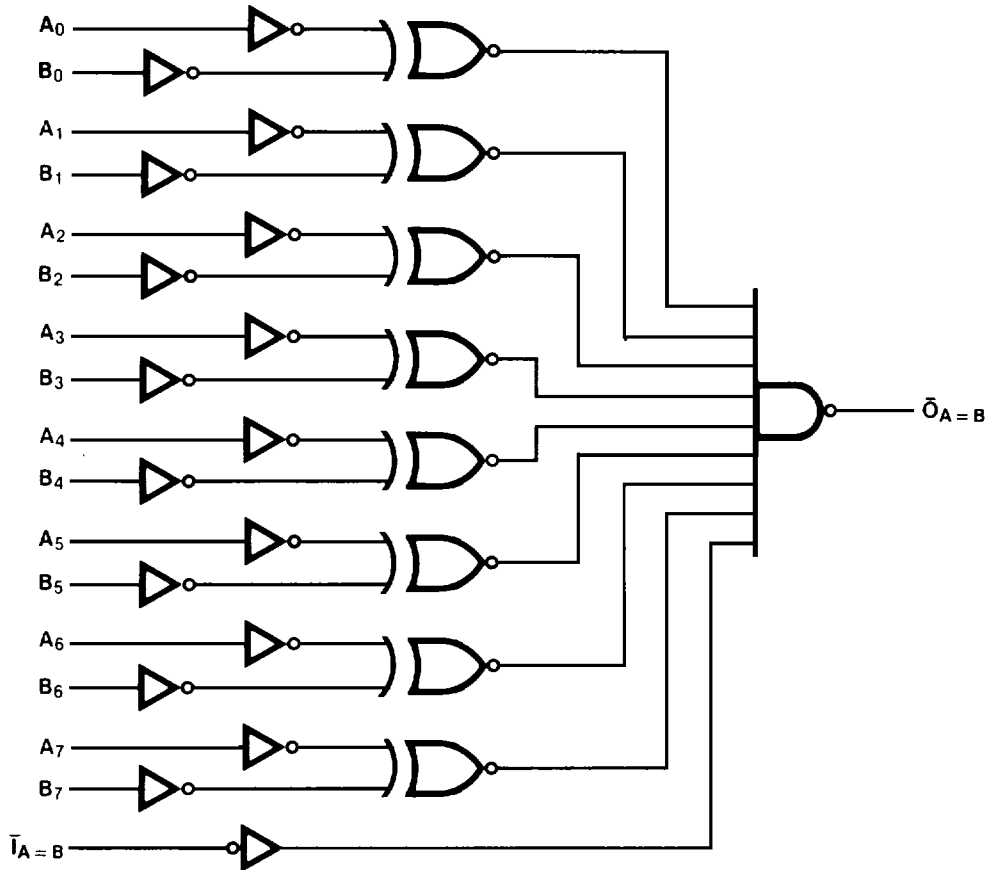for LCC**

AC520 • ACT520 • AC521 • ACT521

Truth Table

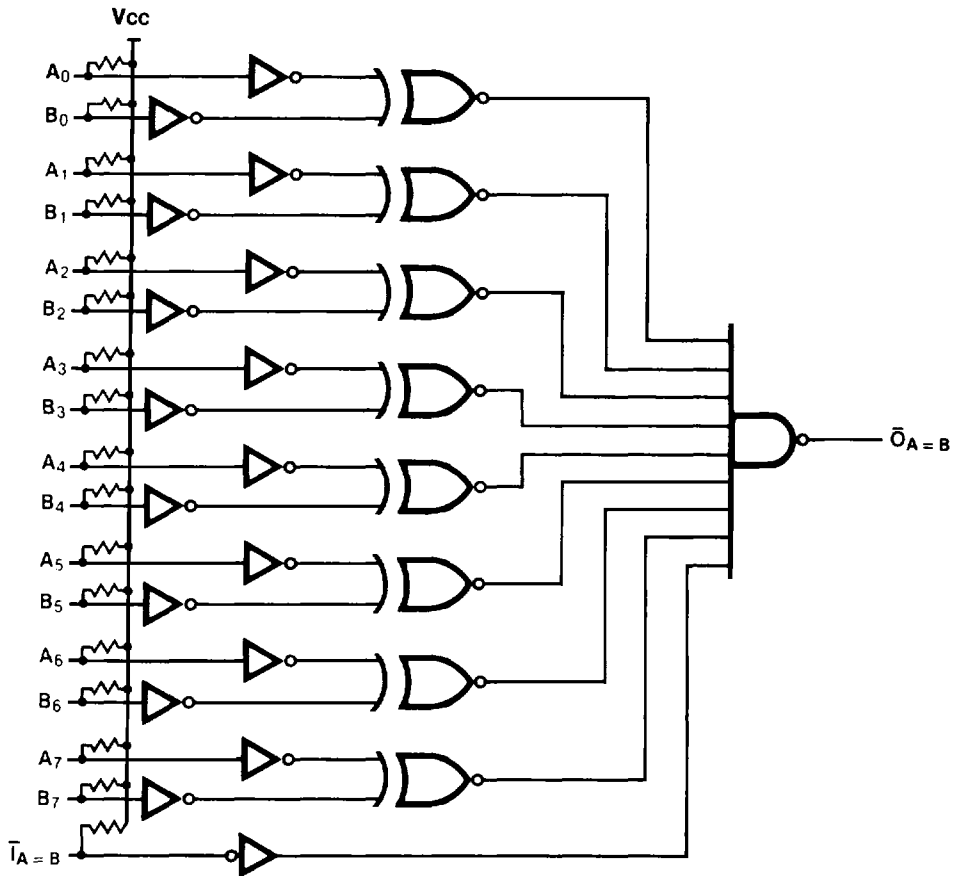| Inputs		Outputs
$\overline{I}_{A=B}$	A, B	$\overline{O}_{A=B}$
L	$A = B^*$	L
L	$A \neq B$	H
H	$A = B^*$	H
H	$A \neq B$	H

H = HIGH Voltage Level
L = LOW Voltage level
*$A_0 = B_0$, $A_1 = B_1$, $A_2 = B_2$, etc.

Logic Diagram ('AC/'ACT520)

Please note that this diagram is provided only for the understanding of logic operations and should not be used to estimate propagation delays.

Logic Diagram ('AC/ACT521)

Please note that this diagram is provided only for the understanding of logic operations and should not be used to estimate propagation delays.

DC Characteristics (unless otherwise specified)

Symbol	Parameter	54AC/ACT	74AC/ACT	Units	Conditions
I_{CC}	Maximum Quiescent Supply Current	160	80	μA	$V_{IN} = V_{CC}$ or Ground, $V_{CC} = 5.5$ V, $T_A =$ Worst Case
I_{CC}	Maximum Quiescent Supply Current	8.0	8.0	μA	$V_{IN} = V_{CC}$ or Ground, $V_{CC} = 5.5$ V, $T_A = 25°C$
I_{CCT}	Maximum Additional I_{CC}/Input ('ACT520/521)	1.6	1.5	mA	$V_{IN} = V_{CC} - 2.1$ V $V_{CC} = 5.5$ V, $T_A =$ Worst Case

AC520 • ACT520 • AC521 • ACT521

AC Characteristics

Symbol	Parameter	Vcc* (V)	74AC TA = +25°C CL = 50 pF			54AC TA = −55°C to +125°C CL = 50 pF		74AC TA = −40°C to +85°C CL = 50 pF		Units	Fig. No.
			Min	Typ	Max	Min	Max	Min	Max		
tPLH	Propagation Delay An or Bn to $\overline{O}_{A=B}$	3.3 5.0		13.0 9.5						ns	3-6
tPHL	Propagation Delay An or Bn to $\overline{O}_{A=B}$	3.3 5.0		13.0 9.5						ns	3-6
tPLH	Propagation Delay $\overline{I}_{A=B}$ to $\overline{O}_{A=B}$	3.3 5.0		9.0 6.5						ns	3-6
tPHL	Propagation Delay $\overline{I}_{A=B}$ to $\overline{O}_{A=B}$	3.3 5.0		9.5 7.0						ns	3-6

*Voltage Range 3.3 is 3.3 V ± 0.3 V
Voltage Range 5.0 is 5.0 V ± 0.5 V

AC Characteristics

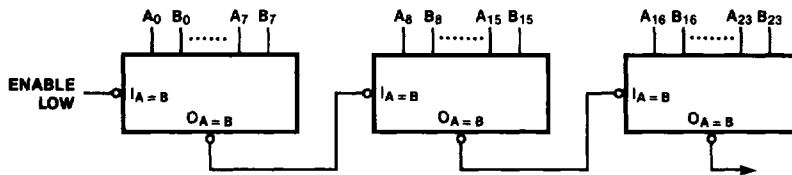| Symbol	Parameter	Vcc* (V)	74ACT TA = +25°C CL = 50 pF			54ACT TA = −55°C to +125°C CL = 50 pF		74ACT TA = −40°C to +85°C CL = 50 pF		Units	Fig. No.
			Min	Typ	Max	Min	Max	Min	Max		
tPLH	Propagation Delay An or Bn to $\overline{O}_{A=B}$	5.0		9.5						ns	3-6
tPHL	Propagation Delay An or Bn to $\overline{O}_{A=B}$	5.0		9.5						ns	3-6
tPLH	Propagation Delay $\overline{I}_{A=B}$ to $\overline{O}_{A=B}$	5.0		6.5						ns	3-6
tPHL	Propagation Delay $\overline{I}_{A=B}$ to $\overline{O}_{A=B}$	5.0		7.0						ns	3-6

*Voltage Range 5.0 is 5.0 V ± 0.5 V

Military parameters given herein are for general references only. For current military specifications and subgroup testing information please request Fairchild's Table I data sheet from your Fairchild sales engineer or account representative.

Capacitance

Symbol	Parameter	54/74AC/ACT	Units	Conditions
		Typ		
C_{IN}	Input Capacitance	4.5	pF	$V_{CC} = 5.5$ V
C_{PD}	Power Dissipation Capacitance		pF	$V_{CC} = 5.5$ V

Applications

Ripple Expansion

Parallel Expansion