

# MC54F/74F521

## 8-BIT IDENTITY COMPARATOR

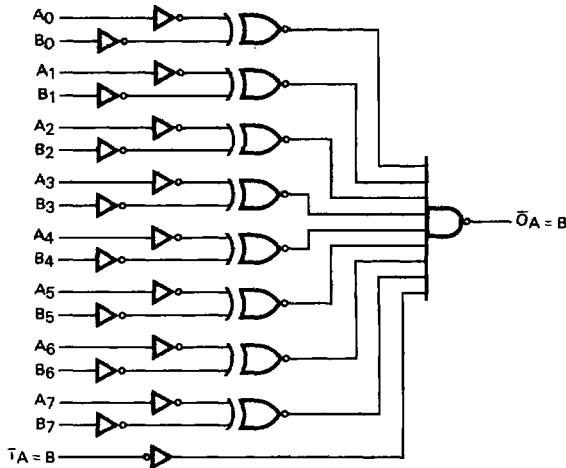
**DESCRIPTION** — The MC54F/74F521 is an expandable 8-bit comparator. It compares two words of up to eight bits each and provides a LOW output when the two words match bit for bit. The expansion input  $\bar{I}_A = B$  also serves as an active-LOW enable input.

- Compares Two 8-Bit Words in 6.5 ns Typ
- Expandable to Any Word Length
- 20-Pin Package

## 8-BIT IDENTITY COMPARATOR

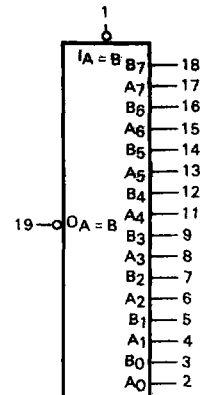
**FAST™ SCHOTTKY TTL**

**LOGIC DIAGRAM**



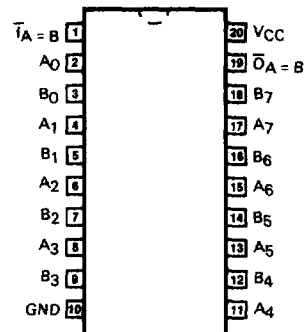
Please note that this diagram is provided only for the understanding of logic operations and should not be used to estimate propagation delays.

**LOGIC SYMBOL**



VCC = Pin 20  
GND = Pin 10

**CONNECTION DIAGRAM**



J Suffix — Case 732-03 (Ceramic)  
N Suffix — Case 738-03 (Plastic)  
DW Suffix — Case 751D-03 (SOIC)

## GUARANTEED OPERATING RANGES

SYMBOL	PARAMETER		MIN	TYP	MAX	UNIT
V <sub>CC</sub>	Supply Voltage	54, 74	4.50	5.0	5.50	V
T <sub>A</sub>	Operating Ambient Temperature Range	54	-55	25	125	°C
		74	0	25	70	
I <sub>OH</sub>	Output Current — High	54, 74			-1.0	mA
I <sub>OL</sub>	Output Current — Low	54, 74			20	mA

## DC CHARACTERISTICS OVER OPERATING TEMPERATURE RANGE (unless otherwise specified)

SYMBOL	PARAMETER	LIMITS			UNITS	TEST CONDITIONS
		MIN	TYP	MAX		
V <sub>IH</sub>	Input HIGH Voltage	2.0			V	Guaranteed Input HIGH Voltage
V <sub>IL</sub>	Input LOW Voltage			0.8	V	Guaranteed Input LOW Voltage
V <sub>IK</sub>	Input Clamp Diode Voltage			-1.2	V	I <sub>IN</sub> = -18 mA V <sub>CC</sub> = MIN
V <sub>OH</sub>	Output HIGH Voltage	54, 74	2.5	3.4	V	I <sub>OH</sub> = -1.0 mA V <sub>CC</sub> = 4.5 V
		74	2.7	3.4	V	I <sub>OH</sub> = -1.0 mA V <sub>CC</sub> = 4.75 V
V <sub>OL</sub>	Output LOW Voltage		0.35	0.5	V	I <sub>OL</sub> = 20 mA V <sub>CC</sub> = MIN
I <sub>IH</sub>	Input HIGH Current			20	μA	V <sub>IN</sub> = 2.7 V V <sub>CC</sub> = MAX
				100	μA	V <sub>IN</sub> = 7.0 V
I <sub>IL</sub>	Input LOW Current			-0.6	mA	V <sub>IN</sub> = 0.5 V V <sub>CC</sub> = MAX
I <sub>OS</sub>	Output Short Circuit Current (Note 2)	-60		-150	mA	V <sub>OUT</sub> = 0 V V <sub>CC</sub> = MAX
I <sub>CC</sub>	Power Supply Current		21	32	mA	$\bar{T}_A = B = \text{Gnd}$ V <sub>CC</sub> = MAX

## NOTES:

- For conditions such as MIN or MAX, use the appropriate value specified under guaranteed operating ranges.
- Not more than one output should be shorted at a time, nor for more than 1 second.

## TRUTH TABLE

Inputs		Output
$\bar{T}_A = B$	A, B	$\bar{O}_A = B$
L	A = B*	L
L	A ≠ B	H
H	A = B*	H
H	A ≠ B	H

H = HIGH Voltage Level

L = LOW Voltage Level

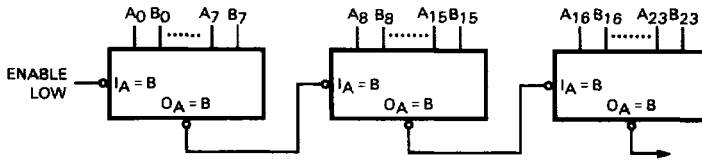
\*A<sub>0</sub> = B<sub>0</sub>, A<sub>1</sub> = B<sub>1</sub>, A<sub>2</sub> = B<sub>2</sub>, etc.

AC CHARACTERISTICS

SYMBOL	PARAMETER	54/74F			54F		74F		UNITS
		T <sub>A</sub> = +25°C V <sub>CC</sub> = +5.0 V C <sub>L</sub> = 50 pF			T <sub>A</sub> = -55 to +125°C V <sub>CC</sub> = 5.0 V ±10% C <sub>L</sub> = 50 pF		T <sub>A</sub> = 0 to +70°C V <sub>CC</sub> = 5.0 V ±10% C <sub>L</sub> = 50 pF		
		MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t <sub>PLH</sub>	Propagation Delay	2.5	6.5	10	2.5	15	2.5	11	ns
t <sub>PHL</sub>	A <sub>n</sub> or B <sub>n</sub> to $\overline{O_A} = B$	3.0	6.5	10	3.0	12	3.0	11	
t <sub>PLH</sub>	Propagation Delay	2.5	4.5	6.5	2.5	8.5	2.5	7.5	ns
t <sub>PHL</sub>	$\overline{I_A} = B$ to $\overline{O_A} = B$	3.5	5.0	9.0	3.5	10	3.5	10	

APPLICATIONS

Ripple Expansion



Parallel Expansion

