MOTOROLA

MC54F521
MC74F521

8-BIT IDENTITY COMPARATOR

FAST™ SCHOTTKY TTL

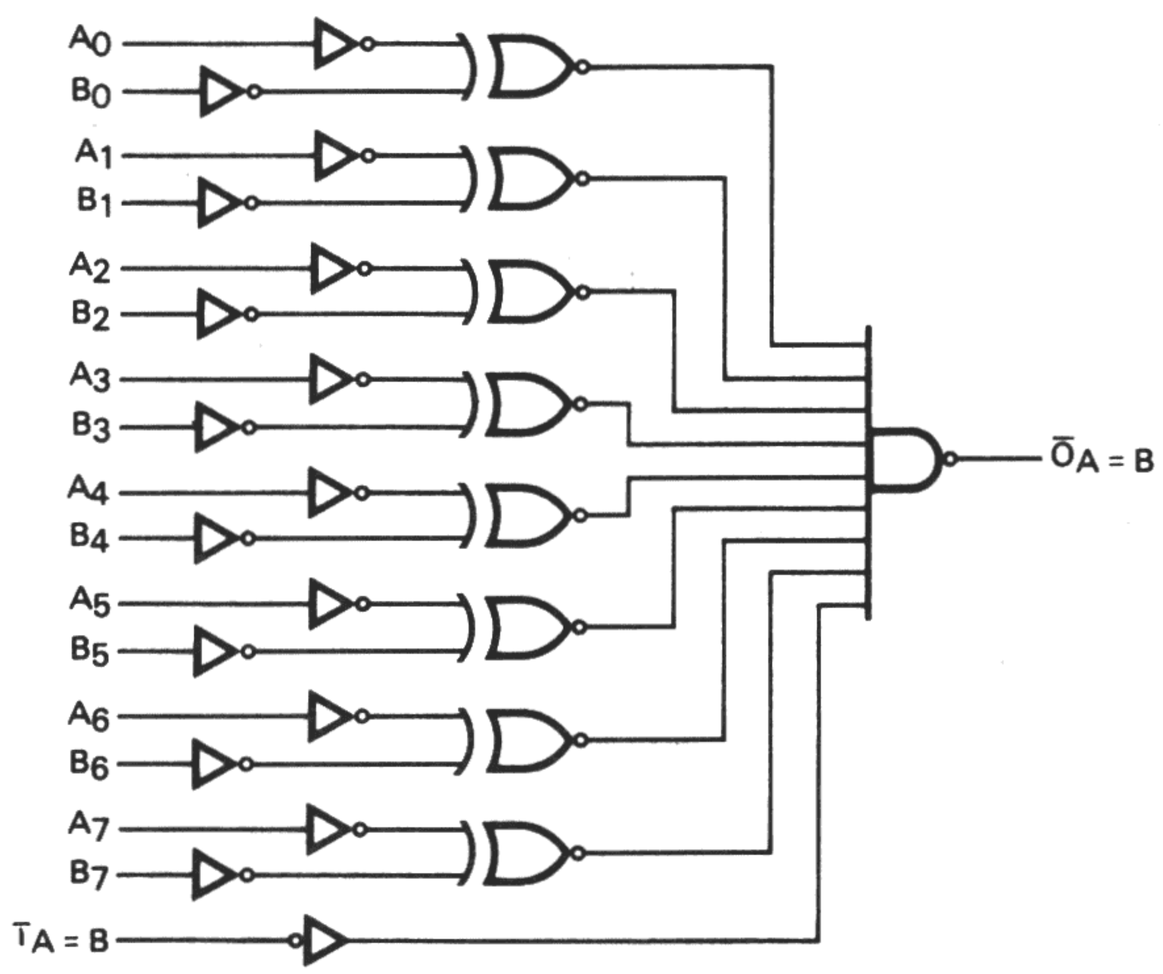
Advance Information

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 $\overline{I}_{A=B}$ also serves as an active-LOW enable input.

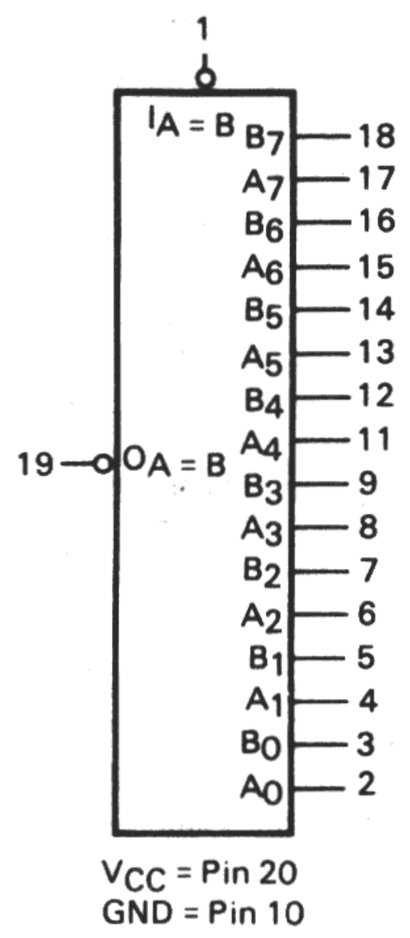
- **Compares Two 8-Bit Words in 6.5 ns Typ**
- **Expandable to Any Word Length**
- **20-Pin Package**

LOGIC DIAGRAM



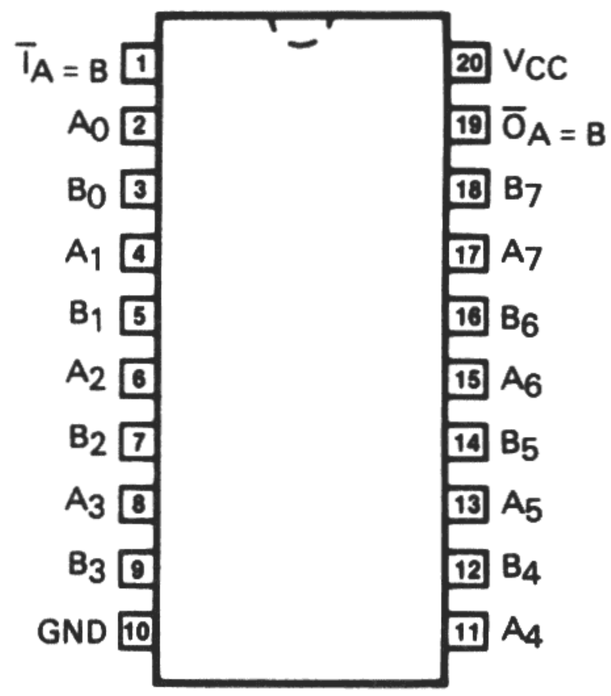
Please note that this diagram is provided only for the understanding of logic operations and should not be used to estimate propagation delays.

LOGIC SYMBOL



V_{CC} = Pin 20
GND = Pin 10

CONNECTION DIAGRAM



J Suffix — Case 732-03 (Ceramic)
N Suffix — Case 738-01 (Plastic)

FAST is a trademark of Fairchild Camera and Instrument Corporation.

This document contains information on a new product. Specifications and information herein are subject to change without notice.

GUARANTEED OPERATING RANGES

SYMBOL	PARAMETER		MIN	TYP	MAX	UNIT
V_{CC}	Supply Voltage*	54	4.50	5.0	5.50	V
		74	4.75	5.0	5.25	
T_A	Operating Ambient Temperature Range	54	–55	25	125	°C
		74	0	25	70	
I_{OH}	Output Current — High	54, 74			-1.0	mA
I_{OL}	Output Current — Low	54, 74			20	mA

*74F devices may be operated over the 4.5 to 5.5 V supply range where they will meet the specifications of 54F devices over the 0° to 70°C temperature range.

DC CHARACTERISTICS OVER OPERATING TEMPERATURE RANGE (unless otherwise specified)

SYMBOL	PARAMETER		LIMITS MIN	LIMITS TYP	LIMITS MAX	UNITS	TEST CONDITIONS	
V_{IH}	Input HIGH Voltage		2.0			V	Guaranteed Input HIGH Voltage	
V_{IL}	Input LOW Voltage				0.8	V	Guaranteed Input LOW Voltage	
V_{IK}	Input Clamp Diode Voltage				–1.2	V	I_{IN} = –18 mA	V_{CC} = MIN
V_{OH}	Output HIGH Voltage	54	2.5	3.4		V	I_{OH} = –1.0mA	V_{CC} = MIN
		74	2.7	3.4		V	I_{OH} = –1.0 mA	
V_{OL}	Output LOW Voltage			0.35	0.5	V	I_{OL} = 20 mA	V_{CC} = MIN
I_{IH}	Input HIGH Current				20	μA	V_{IN} = 2.7 V	V_{CC} = MAX
					100	μA	V_{IN} = 7.0 V	
I_{IL}	Input LOW Current				–0.6	mA	V_{IN} = 0.5 V	V_{CC} = MAX
I_{OS}	Output Short Circuit Current (Note 2)		–60		–150	mA	V_{OUT} = 0 V	V_{CC} = MAX
I_{CCH}	Power Supply Current			24	36	mA	$\overline{I}_A$ = B = Gnd	V_{CC} = MAX
I_{CCL}				15.5	23			

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

TRUTH TABLE

Inputs		Output
$\overline{I}_{A=B}$	A, B	$\overline{O}_{A=B}$
L	A = B*	L
L	A ≠ B	H
H	A = B*	H
H	A ≠ B	H

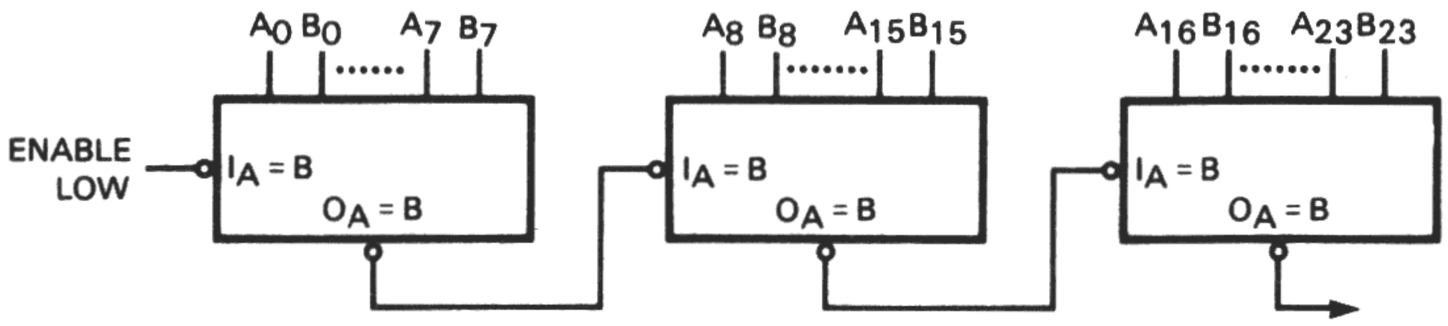
H = HIGH Voltage Level
L = LOW Voltage Level
*$A_0 = B_0$, $A_1 = B_1$, $A_2 = B_2$, etc.

AC CHARACTERISTICS

SYMBOL	PARAMETER	54/74F T_A = +25°C V_{CC} = +5.0 V C_L = 50 pF			54F T_A = −55 to +125°C V_{CC} = 5.0 V ±10% C_L = 50 pF		74F T_A = 0 to +70°C V_{CC} = 5.0 V ±5% C_L = 50 pF		UNITS
		MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t_{PLH} t_{PHL}	Propagation Delay A_n or B_n to $\overline{O}_A = B$	3.5 4.0	6.5 6.5	9.5 9.0	3.5 4.0	15 12	3.5 4.0	11 10.5	ns
t_{PLH} t_{PHL}	Propagation Delay $\overline{I}_{A=B}$ to $\overline{O}_A = B$	3.0 3.5	4.5 5.0	6.5 7.0	3.0 3.5	8.5 9.0	3.0 3.5	7.5 8.0	ns

APPLICATIONS

Ripple Expansion



Parallel Expansion