MOTOROLA

MC54/74F521

8-BIT IDENTITY COMPARATOR

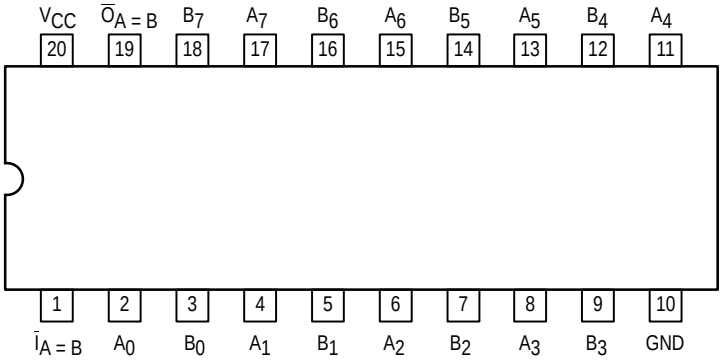
The MC54/74F521 is an expandable 8-bit comparator. It compares two words of up to eight bits each and provides a LOW output when the two words match bit for bit. The expansion input $\overline{I}_{A=B}$ also serves as an active-LOW enable input.

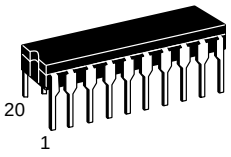
- Compares Two 8-Bit Words in 6.5 ns Typical
- Expandable to Any Word Length
- 20-Pin Package

8-BIT IDENTITY COMPARATOR

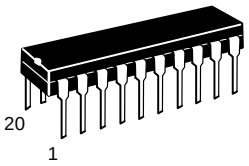
FAST™ SCHOTTKY TTL

CONNECTION DIAGRAM (TOP VIEW)

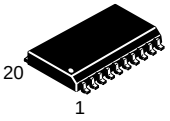




J SUFFIX
CERAMIC
CASE 732-03



N SUFFIX
PLASTIC
CASE 738-03



DW SUFFIX
SOIC
CASE 751D-03

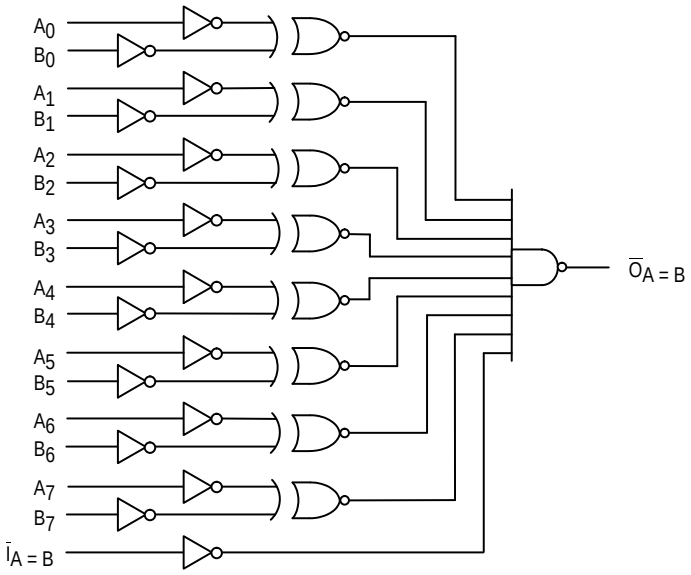
ORDERING INFORMATION

MC54FXXXJ	Ceramic
MC74FXXXN	Plastic
MC74FXXXDW	SOIC

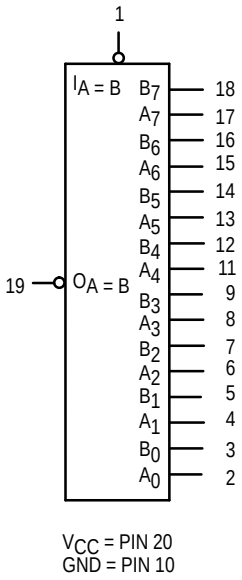
GUARANTEED OPERATING RANGES

Symbol	Parameter		Min	Typ	Max	Unit
V_{CC}	Supply Voltage	54, 74	4.5	5.0	5.5	V
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

LOGIC DIAGRAM



LOGIC SYMBOL



NOTE:
This diagram is provided only for the understanding
of logic operations and should not be used to estimate propagation delays.

DC CHARACTERISTICS OVER OPERATING TEMPERATURE RANGE (unless otherwise specified)

Symbol	PARAMETER		Limits Min	Typ	Max	Unit	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, 74	2.5	3.4		V	I_{OH} = – 1.0 mA	V_{CC} = 4.5 V
		74	2.7	3.4		V	I_{OH} = – 1.0 mA	V_{CC} = 4.75 V
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_{CC}	Power Supply Current			21	32	mA	$\overline{I}_A$ = B = GND	V_{CC} = MAX

NOTES:
1. For conditions shown 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.

FUNCTION TABLE

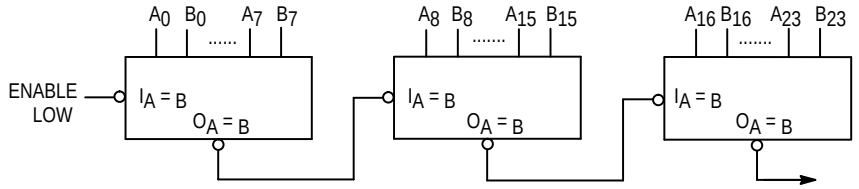
Inputs		Output
$\bar{I}_{A=B}$	A, B	$\bar{O}_{A=B}$
L	A = B*	L
L	A ≠ B	H
H	A = B*	H
H	A ≠ B	H

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

AC CHARACTERISTICS

		54/74F			54F		74F		
		T_A = +25°C V_{CC} = +5.0 V C_L = 50 pF			T_A = –55°C to +125°C V_{CC} = 5.0 V ± 10% C_L = 50 pF		T_A = 0°C to +70°C V_{CC} = 5.0 V ± 10% C_L = 50 pF		
Symbol	Parameter	Min	Typ	Max	Min	Max	Min	Max	Unit
t_{PLH}	Propagation Delay	2.5	6.5	10	2.5	15	2.5	11	ns
t_{PHL}	A_n or B_n to $\bar{O}_{A=B}$	3.0	6.5	10	3.0	12	3.0	11	
t_{PLH}	Propagation Delay	2.5	4.5	6.5	2.5	8.5	2.5	7.5	ns
t_{PHL}	$\bar{I}_{A=B}$ to $\bar{O}_{A=B}$	3.5	5.0	9.0	3.5	10	3.5	10	

Ripple Expansion



Parallel Expansion

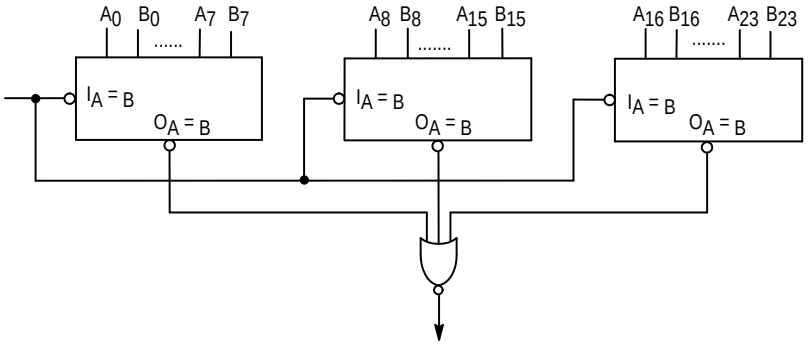


Figure 1. Applications