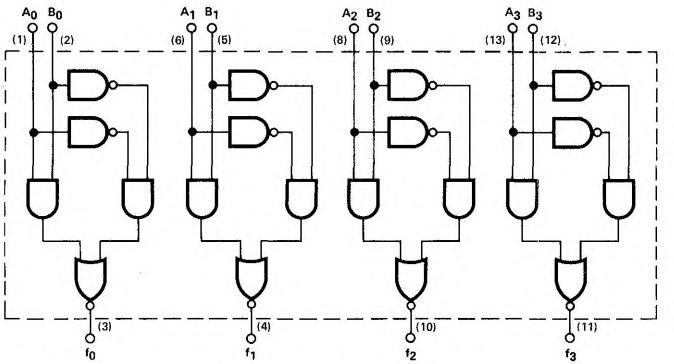
DESCRIPTION

The 8241 contains four independent gating structures to perform the Exclusive-OR function on two input variables. The output of the 8241 employs the totem-pole structure characteristic of TTL devices.

The 8242 contains four independent Exclusive-NOR gates which may be used to implement digital comparison functions. The 8242 outputs are bare collector to facilitate implementation of multiple-bit comparisons; a 4-bit comparison is made by connecting the outputs of the four independent gates together.

LOGIC DIAGRAMS AND TRUTH TABLES

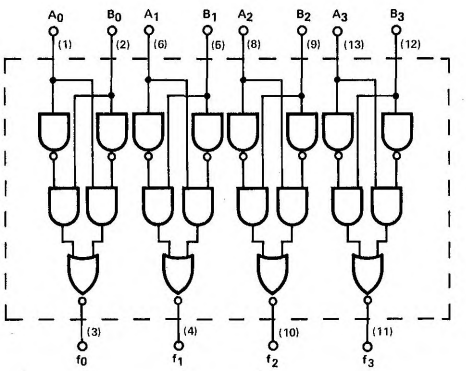
8241 QUAD EXCLUSIVE – OR



A	B	f
0	0	0
1	0	1
0	1	1
1	1	0

V_{CC} = (14)
GND = (7)
( ) = Denotes Pin Numbers for 14 Pin Dual-in-Line Package

8242 4-BIT DIGITAL COMPARATOR (OPEN COLLECTOR)



A	B	f
0	0	1
1	0	0
0	1	0
1	1	1

V_{CC} = (14)
GND = (7)
( ) = Denotes Pin Numbers for 14 Pin Dual-in-Line Package

ELECTRICAL CHARACTERISTICS (Over Recommended Operating Temperature And Voltage) (8241)

CHARACTERISTICS	LIMITS				TEST CONDITIONS			NOTES
	MIN.	TYP.	MAX.	UNITS	INPUTS A	INPUTS B	OUTPUTS	
Output "1" Voltage	2.6	3.5		V	2.0	0.8	−800μA	7
Output "0" Voltage			0.4	V	2.0	2.0	16mA	8
Input "1" Current			80	μA	4.5	4.5V		11
Input "0" Current	-0.1		-3.2	mA	0.4	0.4		12
Power/Current Consumption		225/42.4	300/57.1	mW/mA				13
Output Short Circuit Current	-20		-70	mA			0V	6, 13
Input Voltage Rating								
A Input	5.5			V	10mA	0V		
B Input	5.5			V	0V	10mA		

$T_A = 25°C$ and $V_{CC} = 5.0V$ (8241)

CHARACTERISTICS	LIMITS				TEST CONDITIONS			NOTES
	MIN.	TYP.	MAX.	UNITS	INPUTS A	INPUTS B	OUTPUTS	
Propagation Delay t_{on}		17	23	ns				9
Propagation Delay t_{off}		11	17	ns				9

ELECTRICAL CHARACTERISTICS (Over Recommended Operating Temperature And Voltage) (8242)

CHARACTERISTICS	LIMITS				TEST CONDITIONS			NOTES
	MIN.	TYP.	MAX.	UNITS	INPUTS A	INPUTS B	OUTPUT	
Output "1" Leakage Current			25	μA	2.0	2.0		10
Output "0" Voltage			0.4	V	2.0	0.8	25mA	8
Input "1" Current			80	μA	4.5	4.5V		11
Inpute "0" Current	-0.1		-3.2	mA	0.4	0.4		12
Power/Current Consumption		170/32	260/47.5	mW/mA	0.4	0.4		13
Input Voltage Rating								
A Input	5.5			V	10mA	0V		
B Input	5.5			V	0V	10mA		10

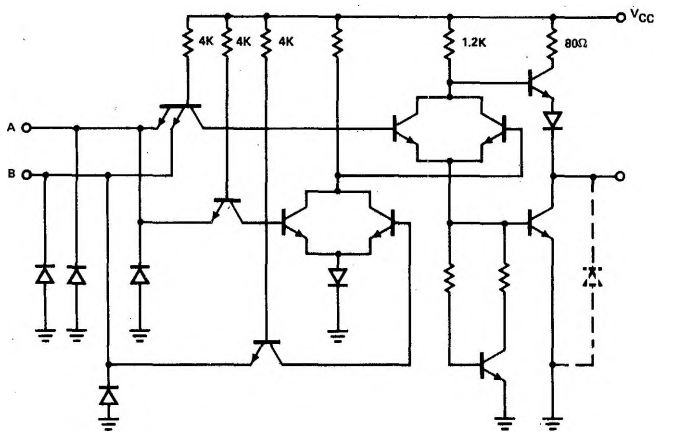
$T_A = 25°C$ and $V_{CC} = 5.0V$ (8242)

CHARACTERISTICS	LIMITS				TEST CONDITIONS			INPUTS
	MIN.	TYP.	MAX.	UNITS	INPUTS A	INPUTS B	OUTPUTS	
Inverting Path t_{on}		12	20	ns				
Inverting Path t_{off}		14	23	ns				
Propagation Delay Non-Inverting Path t_{on}		14	21	ns				9
Propagation Delay Non-Inverting Path t_{off}		20	28	ns				

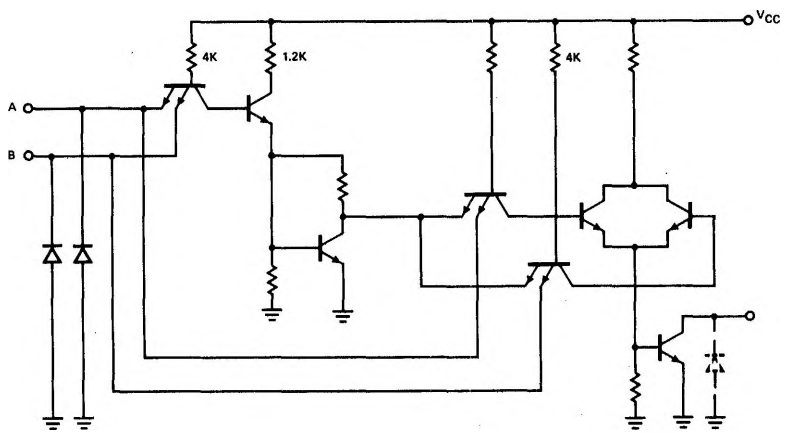
NOTES:
1. All voltage measurements are referenced to the ground terminal. Terminals not specifically referenced are left electrically open.
2. All measurements are taken with ground pin tied to zero volts.
3. Positive current flow is defined as into the terminal referenced.
4. Positive NAND logic definition: "UP" Level = "1", "DOWN" Level = "0".
5. Precautionary measures should be taken to ensure current limiting in accordance with Absolute Maximum Ratings should the isolation diodes become forward biased.
6. Not more than one output should be shorted at a time.
7. Output source current is supplied through a resistor to ground.
8. Output sink current is supplied through a resistor to V_{CC}.
9. Refer to AC Test Figure and waveforms.
10. Connect an external 1K ±1% resistor from V_{CC} to the output terminal for this test.
11. A and B are tested separately. When A is 4.5V, B is 0V, and vice versa.
12. A and B are tested separately. When A is 0.4V, B is 5.25V, and vice versa.
13. V_{CC} = 5.25V.

SCHEMATIC DIAGRAMS

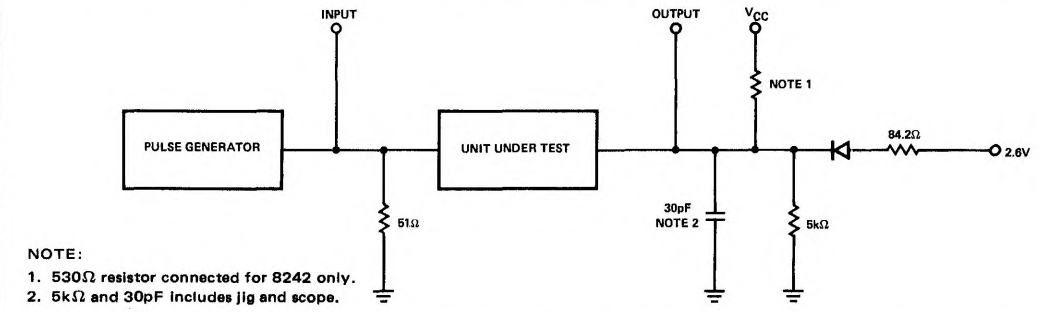
8241



8242 (OPEN COLLECTOR)



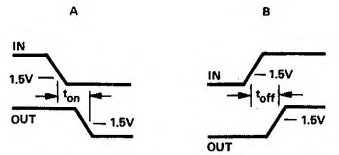
AC TEST FIGURE AND WAVEFORMS



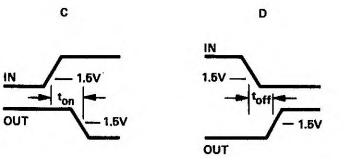
NOTE:
1. 530Ω resistor connected for 8242 only.
2. 5kΩ and 30pF includes jig and scope.

PROPAGATION DELAY WAVEFORMS

NON-INVERTING PATHS

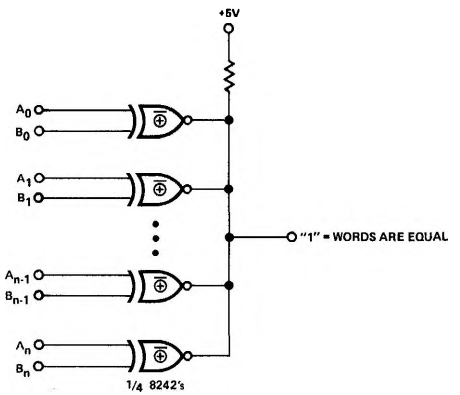


INVERTING PATHS



TYPICAL APPLICATIONS

EQUALITY GATE USED FOR COMPARISON



PARITY GENERATOR/TESTER