

# BINARY-TO-OCTAL DECODER BCD-TO-DECIMAL DECODER

# 82S50 82S52

## DIGITAL 8000 SERIES SCHOTTKY TTL/MSI

### DESCRIPTION

The 82S50 and 82S52 are gate arrays for decoding and logic conversion applications.

The 82S50 converts 3 lines of input to a one-of-eight output. The fourth input line (D) is utilized as an inhibit to allow use in larger decoding networks.

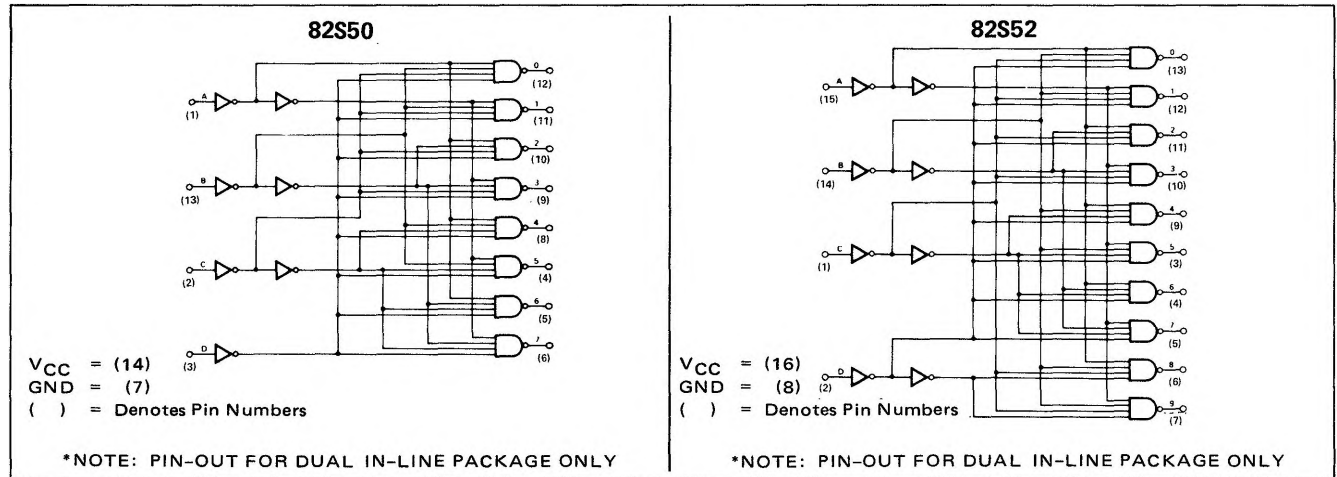
The 82S52 converts a 4 line input code (with 1-2-4-8 weighting) to a one-of-ten output as shown in the Truth Table.

The 82S52 is a direct replacement for the 9301 with all outputs being forced high when a binary code greater than nine is applied to the inputs. The selected output is a logic "0".

### FEATURES

- SCHOTTKY-CLAMPED TTL STRUCTURE
- PNP INPUTS
- INHIBIT INPUT FORCES ALL OUTPUTS HIGH (82S50)
- 82S52 CAN REPLACE 9301 FOR HIGHER SPEED

### LOGIC DIAGRAMS



### TRUTH TABLE

INPUT STATE				OUTPUT STATES									
				82S50								82S52	
A	B	C	D	0	1	2	3	4	5	6	7	8	9
0	0	0	0	0	1	1	1	1	1	1	1	1	1
1	0	0	0	1	0	1	1	1	1	1	1	1	1
0	1	0	0	1	1	0	1	1	1	1	1	1	1
1	1	0	0	1	1	1	0	1	1	1	1	1	1
0	0	1	0	1	1	1	1	0	1	1	1	1	1
1	0	1	0	1	1	1	1	1	0	1	1	1	1
0	1	1	0	1	1	1	1	1	1	0	1	1	1
1	1	1	0	1	1	1	1	1	1	1	0	1	1
0	0	0	1	1	1	1	1	1	1	1	1	0	1
1	0	0	1	1	1	1	1	1	1	1	1	1	0
0	1	0	1	1	1	1	1	1	1	1	1	1	1
1	1	0	1	1	1	1	1	1	1	1	1	1	1
0	0	1	1	1	1	1	1	1	1	1	1	1	1
1	0	1	1	1	1	1	1	1	1	1	1	1	1
0	1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1	1

SIGNETICS DIGITAL 8000 SERIES TTL/MSI – 82S50/82S52

ELECTRICAL CHARACTERISTICS (Over Recommended Operating Temperature and Voltage)

CHARACTERISTICS	LIMITS				A	B	C	D	OUTPUTS	NOTES
	MIN	TYP	MAX	UNITS						
"1" Output Voltage	2.7			V					-1mA	10
"0" Output Voltage			0.5	V					20mA	10
"1" Input Current			10	μA	4.5V	4.5V	4.5V	4.5V		
A, B, C, D			-400	μA	0.5V	0.5V	0.5V	0.5V		
"0" Input Current (ALL)				mA						

TA = 25°C and VCC = 5.0V

CHARACTERISTICS	LIMITS				A	B	C	D	OUTPUTS	NOTES
	MIN	TYP	MAX	UNITS						
Turn-on Delay tON			16	ns						8
Turn-off Delay tOFF			16	ns						8
Power/Current Consumption (82S50 Only)			380/72	mW/mA	5.25V	5.25V	5.25V	0V		11
(82S52 Only)			450/85	mW/mA						
Input Clamp Voltage			-1.2	V	-18mA	-18mA	-18mA	-18mA		
Output Short Circuit Current (ALL)	-40		-100	mA	4.0V	4.0V	4.0V	4.0V	0V	11

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 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. Output source current is supplied through a resistor to ground.
7. Output sink current is supplied through a resistor to VCC. Refer to AC Test Figure.

8. Manufacturer reserves the right to make design and process changes and improvements.

9. Inputs for "1" and "0" output voltage test is per TRUTH table with threshold levels of 0.8V for logical "0" and 2.0V for logical "1".

10. VCC = 5.25V.

AC TEST FIGURE AND WAVEFORMS

82S50

TEST TABLE												
TEST NO.	INPUTS				OUTPUTS							
	A	B	C	D	0	1	2	3	4	5	6	7
1	1	1	PG	0								T
2	1	1	PG	0					T			T
3	PG	1	0	0			T	T				
4	0	PG	1	0					T			T
5	0	0	0	PG	T							
6	1	0	PG	0		T					T	

"1" = 2.7V    "0" = GROUND

82S52

TEST TABLE												
TEST NO.	INPUTS				OUTPUTS							
	A	B	C	D	0	1	2	3	4	5	6	7
1	0	0	PG	0					T			
2	PG	1	0	0			T	T				
3	0	0	0	PG	T							T
4	1	0	PG	0		T				T		
5	1	PG	0	1								T
6	PG	1	1	0								

"1" = 2.7V    "0" = GROUND