

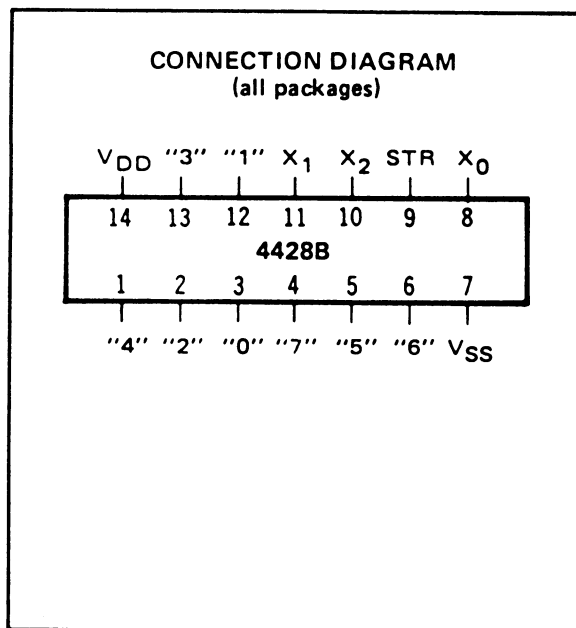
## CMOS BINARY-TO-OCTAL DECODER

### FEATURES

- ◆ Binary-to-Octal Decoding
- ◆ Buffered Outputs Go High on Selection
- ◆ Strobe Input for Simple Expansion

### DESCRIPTION

The 4428B is a one-of-eight CMOS Strobed Decoder. The three inputs labeled  $X_0$ ,  $X_1$ , and  $X_2$ , constitute a three-bit word which defines a number from 0 to 7, and activates one of eight outputs of the decoder. The Strobe line inhibits the outputs from responding to the inputs. If the Strobe line is a logic "1", one of eight outputs is a logic "1". This is an important feature of the Strobe since many 4428B's may be cascading to produce a 1 or N X 8 strobed decoder. This array is particularly useful in expanding memory systems.



**TRUTH TABLE – Strobe at Logical 1**

| Address Input |       |       |       | Output |     |     |     |     |     |     |     |
|---------------|-------|-------|-------|--------|-----|-----|-----|-----|-----|-----|-----|
|               | $X_2$ | $X_1$ | $X_0$ | "0"    | "1" | "2" | "3" | "4" | "5" | "6" | "7" |
| PIN           | 10    | 11    | 8     | 3      | 12  | 2   | 13  | 1   | 5   | 6   | 4   |
|               | 0     | 0     | 0     | 1      | 0   | 0   | 0   | 0   | 0   | 0   | 0   |
|               | 0     | 0     | 1     | 0      | 1   | 0   | 0   | 0   | 0   | 0   | 0   |
|               | 0     | 1     | 0     | 0      | 0   | 1   | 0   | 0   | 0   | 0   | 0   |
|               | 0     | 1     | 1     | 0      | 0   | 0   | 1   | 0   | 0   | 0   | 0   |
|               | 1     | 0     | 0     | 0      | 0   | 0   | 0   | 1   | 0   | 0   | 0   |
|               | 1     | 0     | 1     | 0      | 0   | 0   | 0   | 0   | 1   | 0   | 0   |
|               | 1     | 1     | 0     | 0      | 0   | 0   | 0   | 0   | 0   | 1   | 0   |
|               | 1     | 1     | 1     | 0      | 0   | 0   | 0   | 0   | 0   | 0   | 1   |

### RECOMMENDED OPERATING CONDITIONS

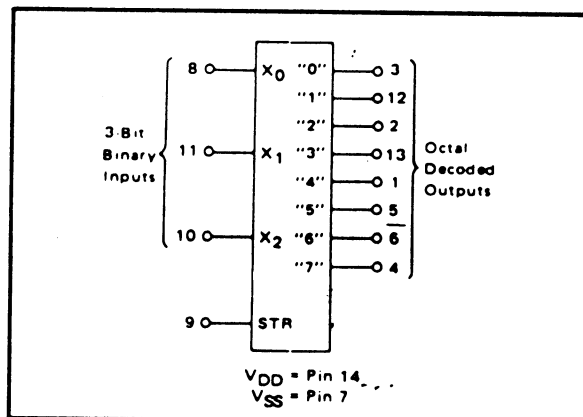
For maximum reliability:

DC Supply Voltage  $V_{DD} - V_{SS}$  3 to 15 Vdc

Operating Temperature  $T_A$

C -55 to +125 °C  
E -40 to +85 °C

### BLOCK DIAGRAM



## ELECTRICAL CHARACTERISTICS

STATIC CHARACTERISTICS<sup>1</sup>

| PARAMETER                | V <sub>DD</sub><br>(Vdc) | CONDITIONS                                                                           | T <sub>LOW</sub> <sup>2</sup> |      | +25°C |      |      | T <sub>HIGH</sub> <sup>2</sup> |      | Units |
|--------------------------|--------------------------|--------------------------------------------------------------------------------------|-------------------------------|------|-------|------|------|--------------------------------|------|-------|
|                          |                          |                                                                                      | Min.                          | Max. | Min.  | Typ. | Max. | Min.                           | Max. |       |
| QUIESCENT DEVICE CURRENT | I <sub>DD</sub>          | V <sub>IN</sub> = V <sub>SS</sub> or V <sub>DD</sub><br>All valid input combinations | —                             | 5    | —     | 0.05 | 5    | —                              | 150  | μAdc  |
|                          |                          |                                                                                      | —                             | 10   | —     | 0.1  | 10   | —                              | 300  |       |
|                          |                          |                                                                                      | —                             | 20   | —     | 0.2  | 20   | —                              | 600  |       |

NOTES: <sup>1</sup> Remaining Static Electrical Characteristics are listed under "4000B Series Family Specifications".

<sup>2</sup> T<sub>LOW</sub> = -55°C for C

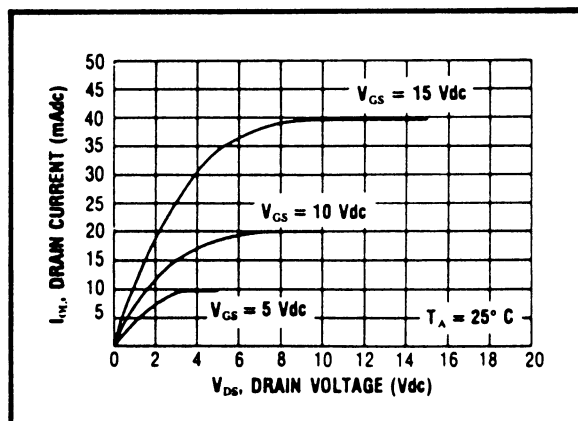
= -40°C for E

T<sub>HIGH</sub> = +125°C for C

= + 85°C for E

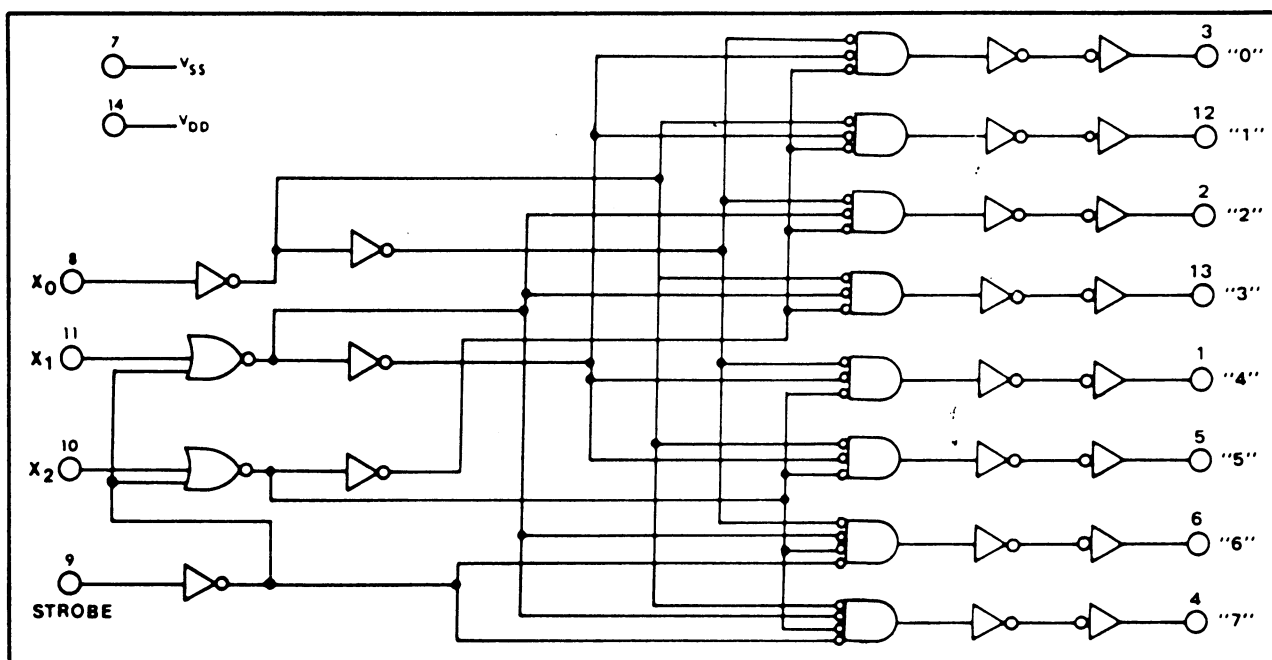
DYNAMIC CHARACTERISTICS (C<sub>L</sub> = 50pF, T<sub>A</sub> = 25°C)

| PARAMETERS             |                                     | V <sub>DD</sub><br>(Vdc) | Min. | Typ. | Max. | Units |
|------------------------|-------------------------------------|--------------------------|------|------|------|-------|
| PROPAGATION DELAY TIME | t <sub>PLH</sub> , t <sub>PHL</sub> | 5                        | —    | 225  | 450  | ns    |
|                        |                                     | 10                       | —    | 100  | 200  |       |
|                        |                                     | 15                       | —    | 70   | 140  |       |
| OUTPUT TRANSITION TIME | t <sub>TLH</sub> , t <sub>THL</sub> | 5                        | —    | 100  | 200  | ns    |
|                        |                                     | 10                       | —    | 50   | 100  |       |
|                        |                                     | 15                       | —    | 40   | 80   |       |



Typical N-Channel  
Sink Current Characteristics

## LOGIC DIAGRAM



# APPLICATIONS INFORMATION

## SIX-BIT BINARY 1-OF-64 DECODER

