



## DM54LS451/DM74LS451 Dual 8:1 Multiplexer

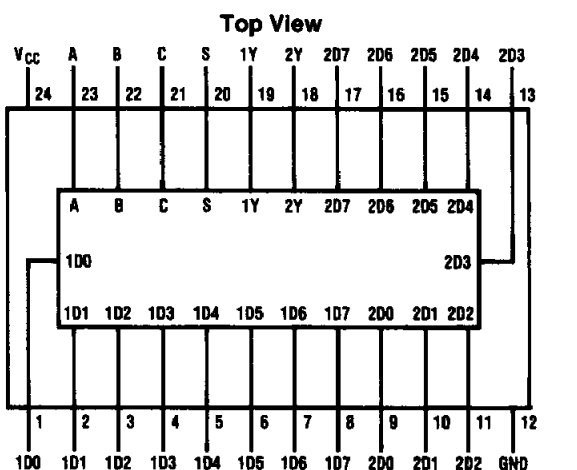
### General Description

The Dual 8:1 Mux selects one of eight inputs, D0 through D7, specified by three binary select inputs, A, B, and C. The true data is output on Y when strobed by S. Propagation delays are the same for inputs, addresses and strobes and are specified for 50 pF loading. Outputs conform to the standard 8 mA LS totem pole drive standard.

### Features/Benefits

- 24-pin SKINNYDIP saves space
- Twice the density of 74LS151
- Low current PNP inputs reduce loading

### Connection Diagram

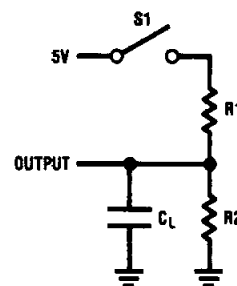


TL/L/8337-1

Order Number DM54LS451J, DM74LS451J,  
DM74LS451N or DM74LS451V

See NS Package Number J24F, N24C or V28A

### Standard Test Load



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### Function Table

| Inputs |   |   |        | Outputs |
|--------|---|---|--------|---------|
| Select |   |   | Strobe | Y       |
| C      | B | A | S      |         |
| X      | X | X | H      | H       |
| L      | L | L | L      | D0      |
| L      | L | H | L      | D1      |
| L      | H | L | L      | D2      |
| L      | H | H | L      | D3      |
| H      | L | L | L      | D4      |
| H      | L | H | L      | D5      |
| H      | H | L | L      | D6      |
| H      | H | H | L      | D7      |

## Absolute Maximum Ratings

If Military/Aerospace specified devices are required, please contact the National Semiconductor Sales Office/Distributors for availability and specifications.

Supply Voltage  $V_{CC}$  7V  
Input Voltage 5.5V

Off-State Output Voltage  
Storage Temperature

5.5V  
-65°C to +150°C

## Operating Conditions

| Symbol   | Parameter                      | Military |     |      | Commercial |     |      | Units |
|----------|--------------------------------|----------|-----|------|------------|-----|------|-------|
|          |                                | Min      | Nom | Max  | Min        | Nom | Max  |       |
| $V_{CC}$ | Supply Voltage                 | 4.5      | 5   | 5.5  | 4.75       | 5   | 5.25 | V     |
| $T_A$    | Operating Free-Air Temperature | -55      |     | 125* | 0          |     | 75   | °C    |

\*Case Temperature

## Electrical Characteristics Over Operating Conditions

| Symbol   | Parameter                     | Test Conditions                                                             |                                                               | Min | Typ† | Max   | Units |
|----------|-------------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------------|-----|------|-------|-------|
| $V_{IL}$ | Low-Level Input Voltage       |                                                                             |                                                               |     |      | 0.8   | V     |
| $V_{IH}$ | High-Level Input Voltage      |                                                                             |                                                               | 2   |      |       | V     |
| $V_{IC}$ | Input Clamp Voltage           | $V_{CC} = \text{MIN}$ $I_I = -18 \text{ mA}$                                |                                                               |     |      | -1.5  | V     |
| $I_{IL}$ | Low-Level Input Current       | $V_{CC} = \text{MAX}$ $V_I = 0.4 \text{ V}$                                 |                                                               |     |      | -0.25 | mA    |
| $I_{IH}$ | High-Level Input Current      | $V_{CC} = \text{MAX}$ $V_I = 2.4 \text{ V}$                                 |                                                               |     |      | 25    | μA    |
| $I_I$    | Maximum Input Current         | $V_{CC} = \text{MAX}$ $V_I = 5.5 \text{ V}$                                 |                                                               |     |      | 1     | mA    |
| $V_{OL}$ | Low-Level Output Voltage      | $V_{CC} = \text{MIN}$<br>$V_{IL} = 0.8 \text{ V}$<br>$V_{IH} = 2 \text{ V}$ | $I_{OL} = 8 \text{ mA}$                                       |     |      | 0.5   | V     |
| $V_{OH}$ | High-Level Output Voltage     | $V_{CC} = \text{MIN}$<br>$V_{IL} = 0.8 \text{ V}$<br>$V_{IH} = 2 \text{ V}$ | MIL $I_{OH} = 2 \text{ mA}$<br>COM $I_{OH} = -3.2 \text{ mA}$ | 2.4 |      |       | V     |
| $I_{OS}$ | Output Short-Circuit Current* | $V_{CC} = 5.0 \text{ V}$ $V_O = 0 \text{ V}$                                |                                                               | -30 |      | -130  | mA    |
| $I_{CC}$ | Supply Current                | $V_{CC} = \text{MAX}$                                                       |                                                               |     | 60   | 100   | mA    |

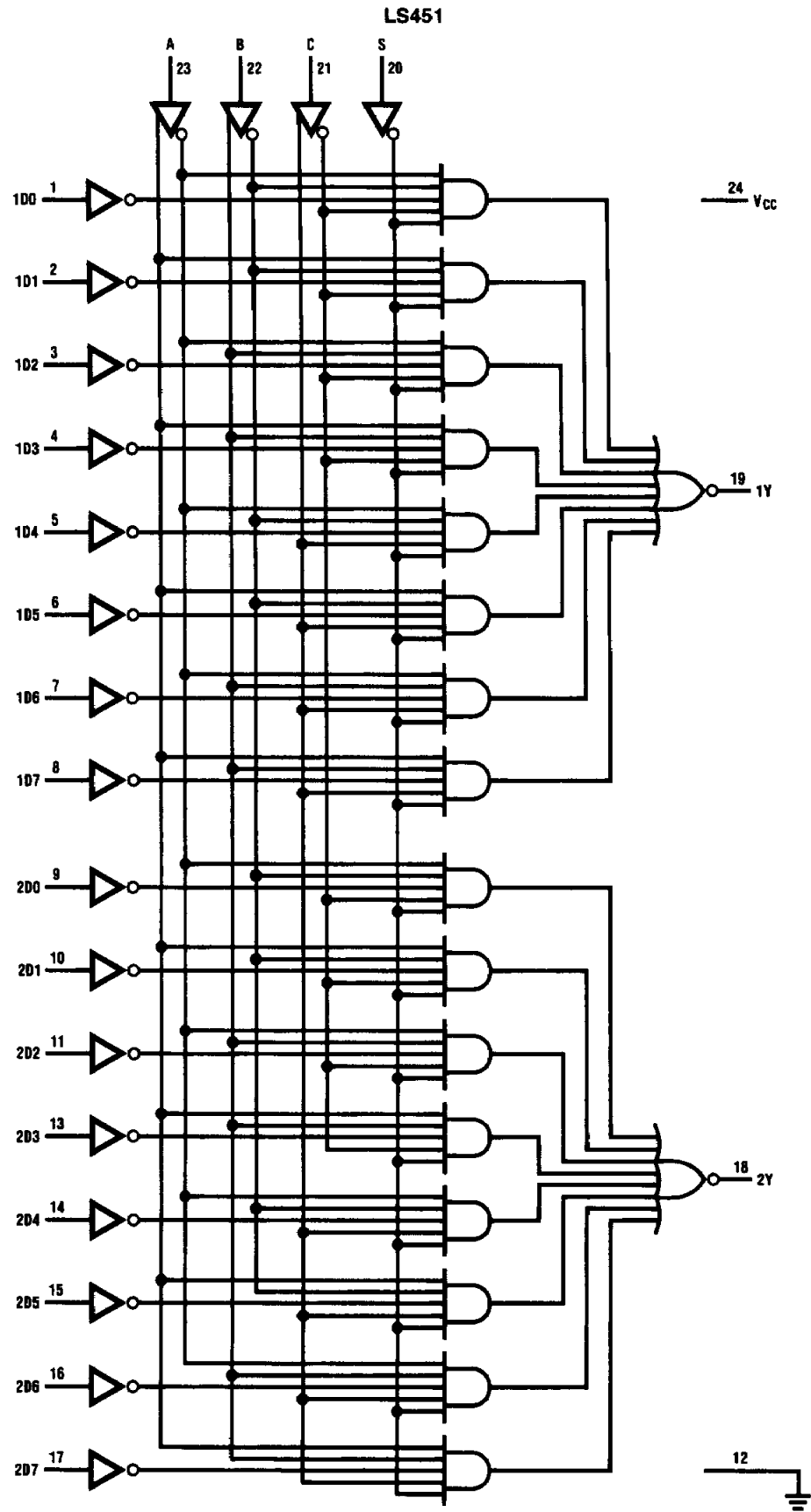
\*No more than one output should be shorted at a time and duration of the short-circuit should not exceed one second.

† All typical values are  $V_{CC} = 5 \text{ V}$ ,  $T_A = 25^\circ \text{C}$ .

## Switching Characteristics Over Operating Conditions

| Symbol   | Parameter      | Test Conditions<br>(See Test Load)                                | Military |     |     | Commercial |     |     | Units |
|----------|----------------|-------------------------------------------------------------------|----------|-----|-----|------------|-----|-----|-------|
|          |                |                                                                   | Min      | Typ | Max | Min        | Typ | Max |       |
| $t_{PD}$ | Any Input to Y | $C_L = 50 \text{ pF}$<br>$R_1 = 560 \Omega$<br>$R_2 = 1.1 \Omega$ |          | 25  | 45  |            | 25  | 40  | ns    |

## Logic Diagram



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