

## DM54LS453/DM74LS453

### Quad 4:1 Multiplexer

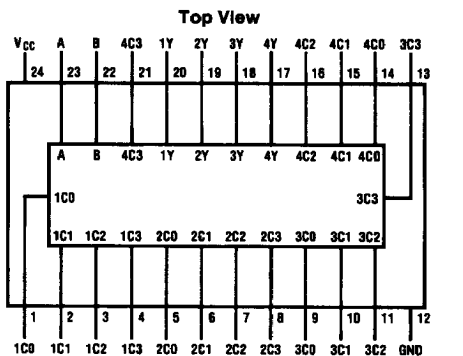
#### General Description

The quad 4:1 Mux selects one of four inputs, C0 through C3, specified by two binary select inputs, A and B. The true data is output on Y. Propagation delays are the same for inputs and addresses and are specified for 50 pF loading. Outputs conform to the standard 8 mA LS totem pole drive standard.

#### Features/Benefits

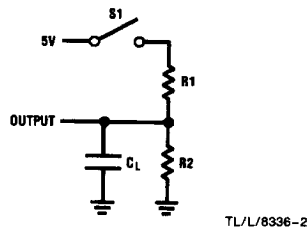
- 24-pin SKINNYDIP saves space
- Twice the density of 74LS153
- Low current PNP inputs reduce loading

#### Connection Diagram



Order Number **DM54LS453J**,  
**DM74LS453J** or **DM74LS453N**  
See NS Package Number **J24F** or **N24C**

#### Standard Test Load



#### Function Table

| INPUT SELECT |   | OUTPUTS<br>Y |
|--------------|---|--------------|
| B            | A |              |
| L            | L | C0           |
| L            | H | C1           |
| H            | L | C2           |
| H            | H | C3           |

## 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  
−66° to +150°C

## Operating Conditions

| Symbol   | Parameter                      | Military |     |      | Commercial |     |      | Units |
|----------|--------------------------------|----------|-----|------|------------|-----|------|-------|
|          |                                | Min      | Typ | Max  | Min        | Typ | 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 $I_{OH} = -2 \text{ mA}$   | 2.4 |      |       | V     |
|          |                               |                                                                             | COM $I_{OH} = -3.2 \text{ mA}$ |     |      |       |       |
| $I_{OS}$ | 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 at  $V_{CC} = 5 \text{ V}$ ,  $T_A = 25^\circ \text{C}$

## 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>$R_2 = 1.1 \text{ k}\Omega$ |          | 25  | 45  |            | 25  | 40  | ns    |

# Logic Diagram

LS453

