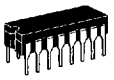
# Dual 4 to 1 Multiplexer

**MC10H174**

The MC10H174 is a Dual 4–to–1 Multiplexer. This device is a functional/ pinout duplication of the standard MECL 10K part, with 100% improvement in propagation delay and no increase in power supply current.

- Propagation Delay, 1.5 ns Typical
- Power Dissipation, 305 mW Typical
- Improved Noise Margin 150 mV (over operating voltage and temperature range)
- Voltage Compensated
- MECL 10K–Compatible



**L SUFFIX**
CERAMIC PACKAGE
CASE 620–10

**P SUFFIX**
PLASTIC PACKAGE
CASE 648–08

**FN SUFFIX**
PLCC
CASE 775–02

**MAXIMUM RATINGS**

| Characteristic | Symbol | Rating | Unit |
|---|---|---|---|
| Power Supply ($V_{CC}$ = 0) | $V_{EE}$ | –8.0 to 0 | Vdc |
| Input Voltage ($V_{CC}$ = 0) | $V_I$ | 0 to $V_{EE}$ | Vdc |
| Output Current— Continuous<br>— Surge | $I_{out}$ | 50<br>100 | mA |
| Operating Temperature Range | $T_A$ | 0 to +75 | °C |
| Storage Temperature Range — Plastic<br>— Ceramic | $T_{stg}$ | –55 to +150<br>–55 to +165 | °C<br>°C |

**ELECTRICAL CHARACTERISTICS** ($V_{EE}$ = –5.2 V ±5%) (See Note)

| Characteristic | Symbol | 0° Min | 0° Max | 25° Min | 25° Max | 75° Min | 75° Max | Unit |
|---|---|---|---|---|---|---|---|---|
| Power Supply Current | $I_E$ | — | 80 | — | 73 | — | 80 | mA |
| Input Current High<br>Pins 3–7 & 9–13<br>Pin 14 | $I_{inH}$ | <br>—<br>— | <br>475<br>670 | <br>—<br>— | <br>300<br>420 | <br>—<br>— | <br>300<br>420 | µAdc |
| Input Current Low | $I_{inL}$ | 0.5 | — | 0.5 | — | 0.3 | — | µA |
| High Output Voltage | $V_{OH}$ | –1.02 | –0.84 | –0.98 | –0.81 | –0.92 | –0.735 | Vdc |
| Low Output Voltage | $V_{OL}$ | –1.95 | –1.63 | –1.95 | –1.63 | –1.95 | –1.60 | Vdc |
| High Input Voltage | $V_{IH}$ | –1.17 | –0.84 | –1.13 | –0.81 | –1.07 | –0.735 | Vdc |
| Low Input Voltage | $V_{IL}$ | –1.95 | –1.48 | –1.95 | –1.48 | –1.95 | –1.45 | Vdc |

**AC PARAMETERS**

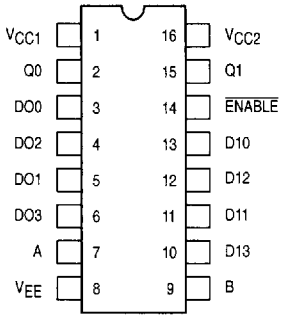
| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Propagation Delay<br>Data<br>Select (A, B)<br>Enable | $t_{pd}$ | <br>0.7<br>1.0<br>0.4 | <br>2.4<br>2.8<br>1.45 | <br>0.8<br>1.1<br>0.4 | <br>2.5<br>2.9<br>1.5 | <br>0.9<br>1.2<br>0.5 | <br>2.6<br>3.2<br>1.7 | ns |
| Rise Time | $t_r$ | 0.5 | 1.5 | 0.5 | 1.6 | 0.5 | 1.7 | ns |
| Fall Time | $t_f$ | 0.5 | 1.5 | 0.5 | 1.6 | 0.5 | 1.7 | ns |

**NOTE:**
Each MECL 10H series circuit has been designed to meet the dc specifications shown in the test table, after thermal equilibrium has been established. The circuit is in a test socket or mounted on a printed circuit board and transverse air flow greater than 500 linear fpm is maintained. Outputs are terminated through a 50–ohm resistor to –2.0 volts.

**TRUTH TABLE**

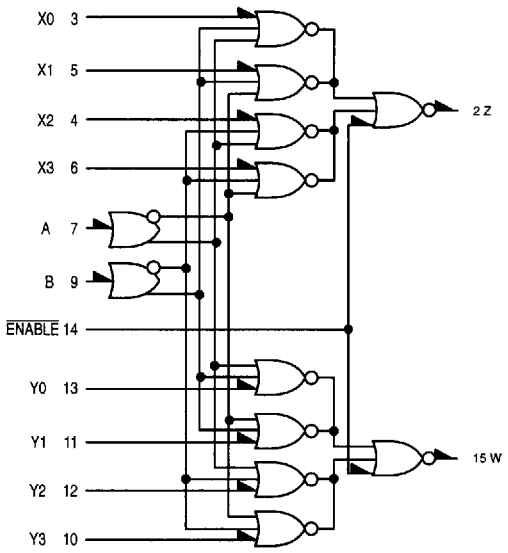
| ENABLE | ADDRESS INPUTS | | OUTPUTS | |
|---|---|---|---|---|
| $\overline{E}$ | B | A | Z | W |
| H | X | X | L | L |
| L | L | L | X0 | Y0 |
| L | L | H | X1 | Y1 |
| L | H | L | X2 | Y2 |
| L | H | H | X3 | Y3 |

**DIP PIN ASSIGNMENT**




Pin assignment is for Dual–in–Line Package.
For PLCC pin assignment, see the Pin Conversion Tables on page 6–11.

## LOGIC DIAGRAM




$V_{CC1}$ = PIN 1
$V_{CC2}$ = PIN 16
$V_{EE}$ = PIN 8