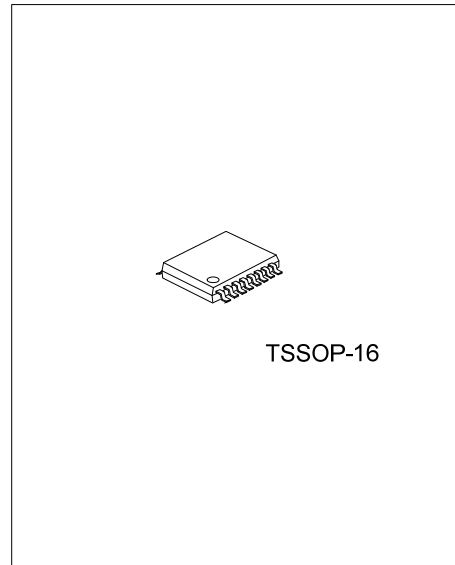




U74AHCT157

CMOS IC

QUADRUPLE 2-LINE TO 1-LINE DATA SELECTOR/ MULTIPLEXER



TSSOP-16

DESCRIPTION

The **U74AHCT157** is a quadruple 2-line to 1-line data selector/multiplexer. When \bar{G} is high, all outputs are low. When \bar{G} is low, a 4-bit word is selected from one of two sources and is routed to the four outputs. The devices provide true data.

FEATURES

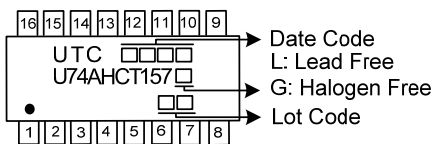
- * TTL-Voltage Compatible
- * Max t_{PD} of 4.1ns from A or B to Y at 5V, $C_L=15pF$
- * Low Quiescent Current: $I_{CC} = 2 \mu A$ (MAX) at 5.5V
- * ± 8 mA output driver at 5V

ORDERING INFORMATION

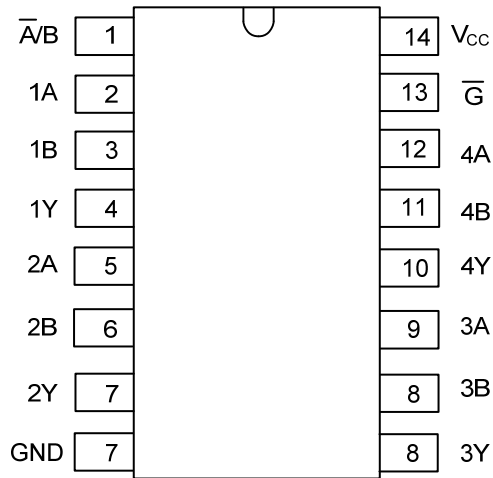
| Ordering Number | | Package | Packing |
|-------------------|-------------------|----------|-----------|
| Lead Free | Halogen Free | | |
| U74AHCT157L-P16-R | U74AHCT157G-P16-R | TSSOP-16 | Tape Reel |

| | |
|--------------------------|---|
| <p>U74AHCT157G-P16-R</p> | <p>(1) Packing Type (1) R: Tape Reel</p> <p>(2) Package Type (2) P16: TSSOP-16</p> <p>(3) Green Package (3) G: Halogen Free and Lead Free, L: Lead Free</p> |
|--------------------------|---|

MARKING



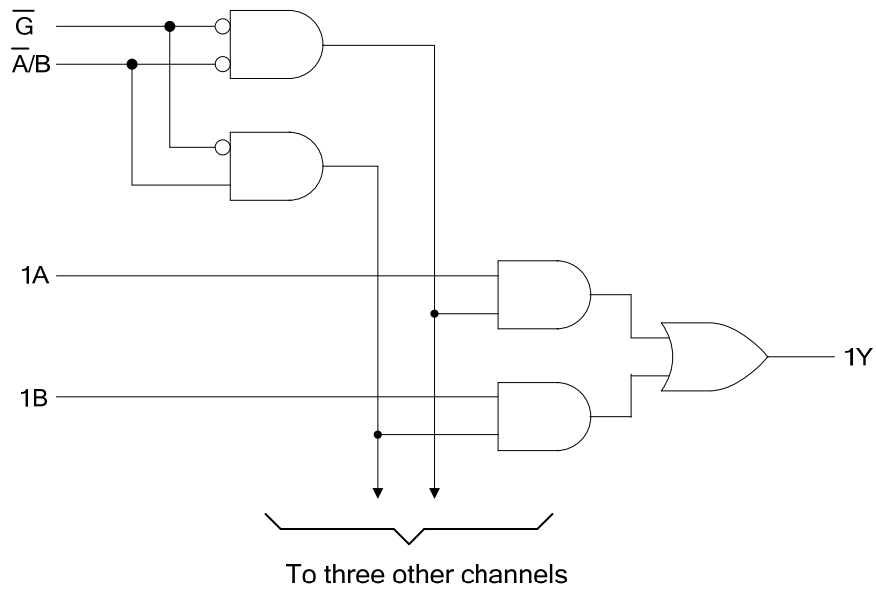
■ PIN CONFIGURATION



■ FUNCTION TABLE

| INPUTS | | | | OUTPUTS |
|-----------|-------------|---|---|---------|
| \bar{G} | \bar{A}/B | A | B | Y |
| H | X | X | X | L |
| L | L | L | X | L |
| L | L | H | X | H |
| L | H | X | L | L |
| L | H | X | H | H |

■ LOGIC DIAGRAM



■ ABSOLUTE MAXIMUM RATING ($T_A = 25^\circ\text{C}$, unless otherwise specified)

| PARAMETER | SYMBOL | RATINGS | UNIT |
|--|-----------|----------------------|------------------|
| Supply Voltage Range | V_{CC} | -0.5~7 | V |
| Input Voltage Range | V_{IN} | -0.5~7 | V |
| Output Voltage Range | V_{OUT} | -0.5~ $V_{CC} + 0.5$ | V |
| Input Clamp Current ($V_{IN} < 0$) | I_{IK} | -20 | mA |
| Output Clamp Current ($V_{OUT} < 0$, or $V_{OUT} > V_{CC}$) | I_{OK} | ± 20 | mA |
| Output Current | I_{OUT} | ± 25 | mA |
| V_{CC} or GND Current | I_{CC} | ± 50 | mA |
| Storage Temperature | T_{STG} | -65 ~ +150 | $^\circ\text{C}$ |

Note: 1. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

2. Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ RECOMMENDED OPERATING COMDITIONS

| PARAMETER | SYMBOL | RATINGS | UNIT |
|---------------------------|-----------------------|--------------|------------------|
| Supply Voltage | V_{CC} | 4.5 ~ 5.5 | V |
| High-Level Input Voltage | V_{IH} | 2 | V |
| Low-Level Input Voltage | V_{IL} | 0.8 | V |
| Input Voltage | V_{IN} | 0 ~ 5.5 | V |
| Output Voltage | V_{OUT} | 0 ~ V_{CC} | V |
| High-Level Output Current | I_{OH} | -8 | mA |
| Low-Level Output Current | I_{OL} | 8 | mA |
| Input Rise or Fall Times | $\Delta t / \Delta V$ | 20 | ns/V |
| Operating Temperature | T_A | -40 ~ +85 | $^\circ\text{C}$ |

■ ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$, unless otherwise specified)

| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|-------------------------------------|-----------------|---|------|-----|-----------|---------------|
| Output Voltage High-Level | V_{OH} | $V_{CC}=4.5\text{V}$, $I_{OH}=-50\mu\text{A}$ | 4.4 | 4.5 | | V |
| | | $V_{CC}=4.5\text{V}$, $I_{OH}=-8\text{mA}$ | 3.94 | | | |
| Output Voltage Low-Level | V_{OL} | $V_{CC}=4.5\text{V}$, $I_{OL}=50\mu\text{A}$ | | | 0.1 | V |
| | | $V_{CC}=4.5\text{V}$, $I_{OL}=8\text{mA}$ | | | 0.36 | |
| Input Leakage Current | $I_{I(LEAK)}$ | $V_{CC}=0\text{V}$ to 5.5V, $V_{IN}=0$ or 5.5V | | | ± 0.1 | μA |
| Quiescent Supply Current | I_{CC} | $V_{CC}=5.5\text{V}$, $V_{IN}=V_{CC}$ or GND, $I_{OUT}=0$ | | | 2 | μA |
| Additional quiescent supply current | ΔI_{CC} | $V_{CC}=5.5\text{V}$, one input at 3.4V, Other inputs at V_{CC} or GND | | | 1.35 | mA |
| Input Capacitance | C_I | $V_{CC}=5\text{V}$, $V_{IN}=V_{CC}$ or GND | | 2 | 10 | pF |

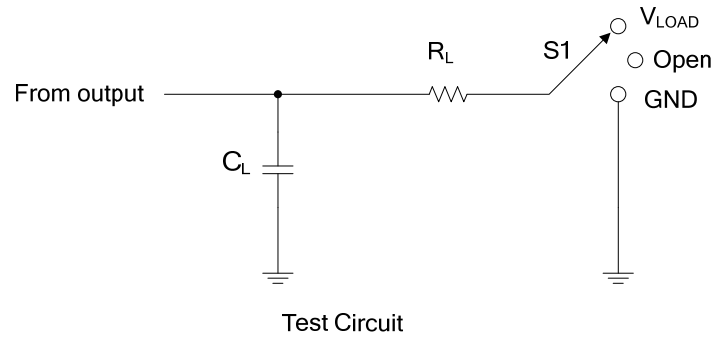
■ SWITCHING CHARACTERISTICS ($V_{CC} = 5V \pm 0.5V$, $T_A = 25^\circ C$)

| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|--|-----------|------------------------------|-----|-----|------|------|
| Propagation delay from input A or B to output Y, t_{PD} | t_{PLH} | $C_L = 15pF, R_L = 1k\Omega$ | | 4.1 | 6.4 | ns |
| | | $C_L = 50pF, R_L = 1k\Omega$ | | 5.6 | 8.7 | |
| | t_{PHL} | $C_L = 15pF, R_L = 1k\Omega$ | | 4.1 | 6.4 | ns |
| | | $C_L = 50pF, R_L = 1k\Omega$ | | 5.6 | 8.7 | |
| Propagation delay from input \bar{A} / B to output Y, t_{PD} | t_{PLH} | $C_L = 15pF, R_L = 1k\Omega$ | | 5.3 | 8.1 | ns |
| | | $C_L = 50pF, R_L = 1k\Omega$ | | 6.8 | 10.4 | |
| | t_{PHL} | $C_L = 15pF, R_L = 1k\Omega$ | | 5.3 | 8.1 | ns |
| | | $C_L = 50pF, R_L = 1k\Omega$ | | 6.8 | 10.4 | |
| Propagation delay from input \bar{G} to output Y, t_{PD} | t_{PLH} | $C_L = 15pF, R_L = 1k\Omega$ | | 5.6 | 8.6 | ns |
| | | $C_L = 50pF, R_L = 1k\Omega$ | | 7.1 | 11 | |
| | t_{PHL} | $C_L = 15pF, R_L = 1k\Omega$ | | 5.6 | 8.6 | ns |
| | | $C_L = 50pF, R_L = 1k\Omega$ | | 7.1 | 11 | |

■ OPERATING CHARACTERISTICS ($T_A = 25^\circ C$)

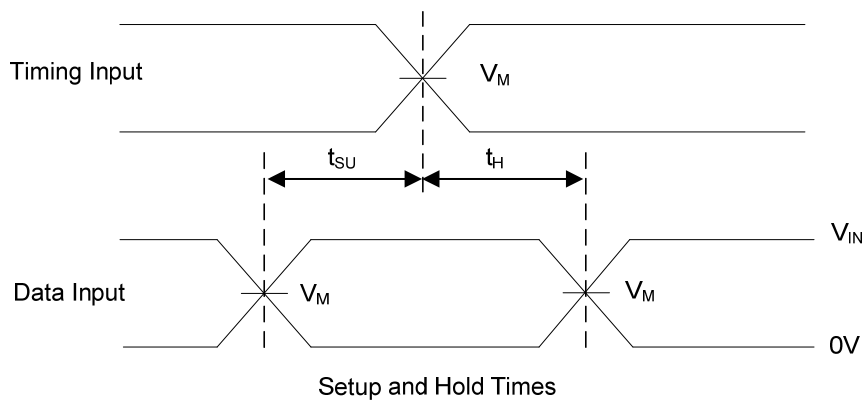
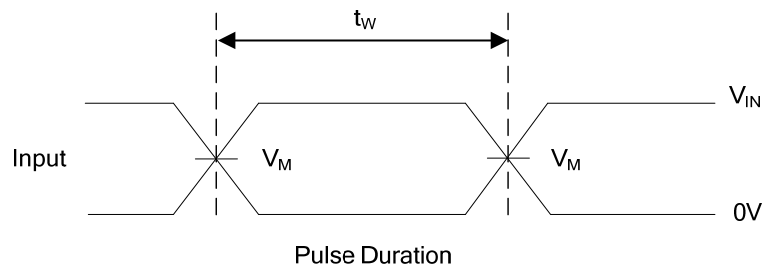
| PARAMETER | SYMBOL | TEST CONDITIONS | RATINGS | UNIT |
|-------------------------------|----------|---|---------|------|
| Power dissipation capacitance | C_{PD} | $V_{CC} = 5V, f = 1MHz, \text{No load}$ | 11 | pF |

■ TEST CIRCUIT AND WAVEFORMS

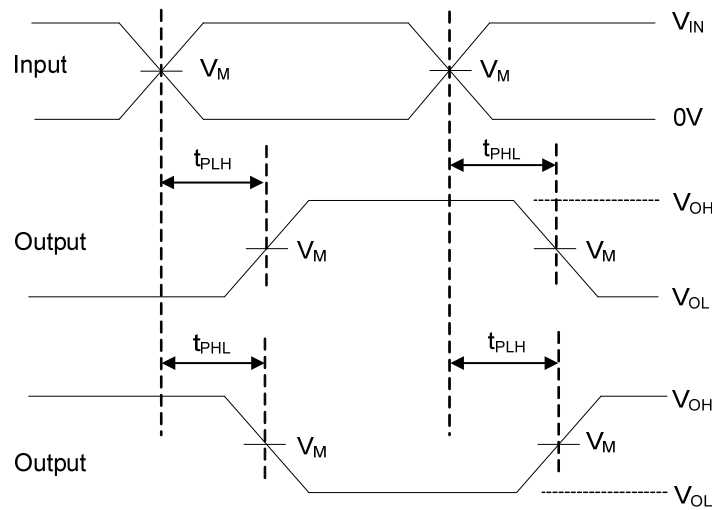


| TEST | S1 |
|-------------------|------------|
| t_{PLH}/t_{PHL} | Open |
| t_{PLZ}/t_{PZL} | V_{LOAD} |
| t_{PHZ}/t_{PZH} | GND |

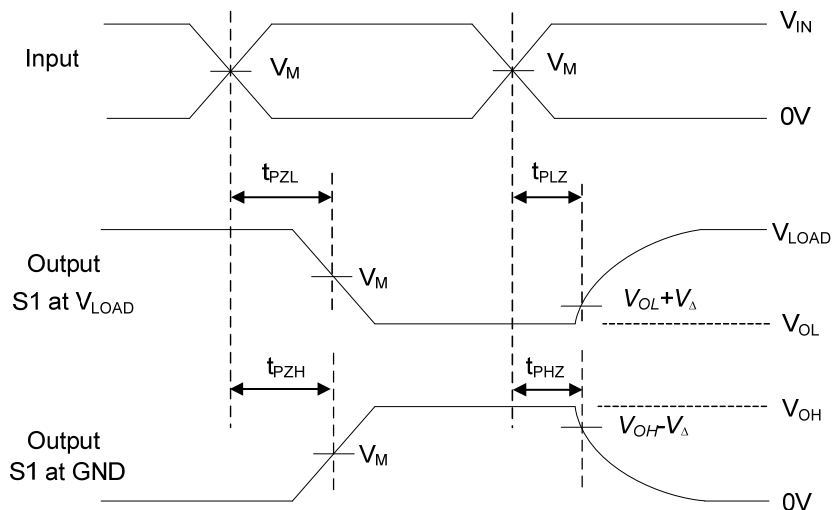
| V_{CC} | Input | | V_M | V_{LOAD} | C_L | R_L | V_{Δ} |
|---------------|----------|------------|------------|------------|-------|-------------|--------------|
| | V_{IN} | t_R, t_F | | | | | |
| $5V \pm 0.5V$ | V_{CC} | $\leq 3ns$ | $V_{CC}/2$ | V_{CC} | 15pF | 1k Ω | 0.5V |
| | | | | | 50pF | | |



■ TEST CIRCUIT AND WAVEFORMS(Cont.)



Voltage Waveforms Propagation Delay Times



Voltage Waveforms Enable and Disable Times

Notes: 1. C_L includes probe and jig capacitance.

2. All input pulses are supplied by generators having the following characteristics: $P_{RR} \leq 1MHz$, $Z_O = 50\Omega$.

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