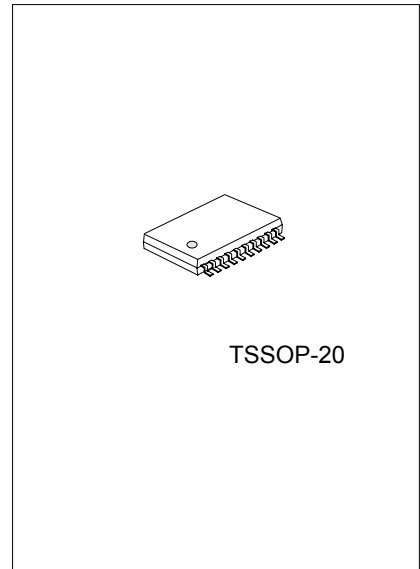




U74HC540

CMOS IC

OCTAL BUFFERS AND LINE DRIVERS WITH 3-STATE OUTPUTS



TSSOP-20

DESCRIPTION

The U74HC540 combines with octal buffers and line drivers with inverting 3-tate outputs. The 3-state output is controlled by output enable inputs $\overline{OE1}$ and $\overline{OE2}$, all eight outputs will be in high-impedance when either of the 2 inputs is applied with high voltage.

FEATURES

- * Operation voltage range: 2V ~ 6V
- * High-current 3-state outputs for bus driver
- * Inverting outputs

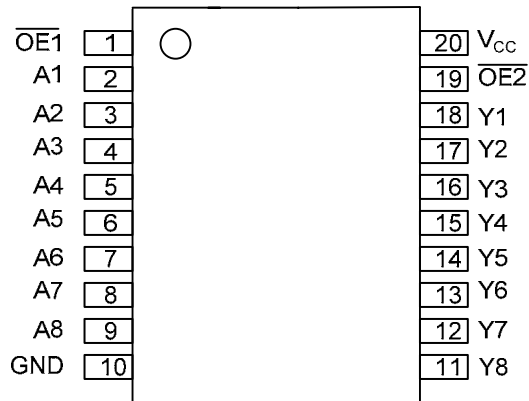
*Pb-free plating product number:
U74HC540L

ORDERING INFORMATION

| Ordering Number | | Package | Packing |
|-----------------|-------------------|----------|-----------|
| Normal | Lead Free Plating | | |
| U74HC540-P20-R | U74HC540L-P20-R | TSSOP-20 | Tape Reel |
| U74HC540-P20-T | U74HC540L-P20-T | TSSOP-20 | Tube |

| | |
|---|---|
| <p>U74HC540L-P20-R</p> <p>(1)Packing Type (2)Package Type (3)Lead Plating</p> | <p>(1) R: Tape Reel, T: Tube (2) P20: TSSOP-20 (3) L: Lead Free Plating, Blank: Pb/Sn</p> |
|---|---|

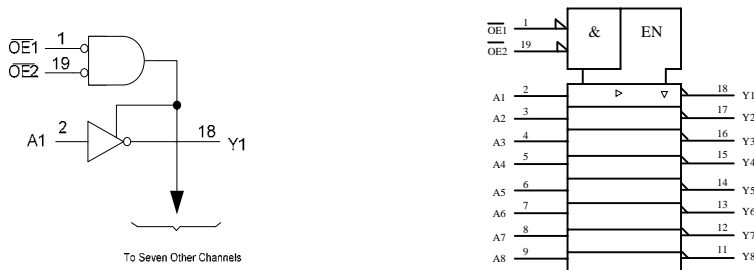
■ PIN CONFIGURATION



■ FUNCTION TABLE (each gate)

| INPUT | | | OUTPUT |
|------------------|------------------|---|--------|
| $\overline{OE1}$ | $\overline{OE2}$ | A | Y |
| L | L | L | H |
| L | L | H | L |
| H | X | X | Z |
| X | H | X | Z |

■ LOGIC DIAGRAM (positive logic)



■ ABSOLUTE MAXIMUM RATINGS (unless otherwise specified)(Note 1)

| PARAMETER | SYMBOL | RATINGS | UNIT |
|-------------------------|-----------|------------|------|
| Supply Voltage | V_{CC} | -0.5~7 | V |
| Input Clamp Current | I_{IK} | ± 20 | mA |
| Output Clamp Current | I_{OK} | ± 20 | mA |
| Output Current | I_{OUT} | ± 35 | mA |
| V_{CC} or GND Current | I_{CC} | ± 70 | mA |
| Storage Temperature | T_{STG} | -65 ~ +150 | |

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 CONDITIONS

| PARAMETER | SYMBOL | CONDITIONS | MIN | TYP | MAX | UNIT |
|------------------------------------|------------|---------------|-----|-----|----------|------|
| Supply Voltage | V_{CC} | | 2 | 5 | 6 | V |
| Input Voltage | V_{IN} | | 0 | | V_{CC} | V |
| Output Voltage | V_{OUT} | | 0 | | V_{CC} | V |
| Input Transition Rise or Fall Rate | t_R, t_F | $V_{CC}=2V$ | 0 | | 1000 | ns |
| | | $V_{CC}=4.5V$ | 0 | | 500 | |
| | | $V_{CC}=6V$ | 0 | | 400 | |
| Operating Temperature | T_A | | -40 | | 85 | |

■ ELECTRICAL CHARACTERISTICS

| PARAMETER | SYMBOL | TEST CONDITIONS | $T_A = 25$ | | | -40~85 | | UNIT |
|---------------------------|---------------|--|------------|------------|-----------|--------|------------|---------|
| | | | MIN | TYP | MAX | MIN | MAX | |
| High-Level Input Voltage | V_{IH} | $V_{CC}=2V$ | | | | 1.5 | | V |
| | | $V_{CC}=4.5V$ | | | | 3.15 | | |
| | | $V_{CC}=6V$ | | | | 4.2 | | |
| Low-Level Input Voltage | V_{IL} | $V_{CC}=2V$ | | | | | 0.5 | V |
| | | $V_{CC}=4.5V$ | | | | | 1.35 | |
| | | $V_{CC}=6V$ | | | | | 1.8 | |
| High-Level Output Voltage | V_{OH} | $V_{CC}=2V, I_{OH}=-20\mu A$ | 1.9 | 1.998 | | 1.9 | | V |
| | | $V_{CC}=4.5V, I_{OH}=-20\mu A$ | 4.4 | 4.499 | | 4.4 | | |
| | | $V_{CC}=6V, I_{OH}=-20\mu A$ | 5.9 | 5.999 | | 5.9 | | |
| | | $V_{CC}=4.5V, I_{OH}=-6mA$ | 3.98 | 4.3 | | 3.84 | | |
| | | $V_{CC}=6V, I_{OH}=-7.8mA$ | 5.48 | 5.8 | | 5.34 | | |
| Low-Level Output Voltage | V_{OL} | $V_{CC}=2V, I_{OH}=20\mu A$ | | 0.002 | 0.1 | | 0.1 | V |
| | | $V_{CC}=4.5V, I_{OH}=20\mu A$ | | 0.001 | 0.1 | | 0.1 | |
| | | $V_{CC}=6V, I_{OH}=20\mu A$ | | 0.001 | 0.1 | | 0.1 | |
| | | $V_{CC}=4.5V, I_{OL}=6mA$ | | 0.17 | 0.26 | | 0.33 | |
| | | $V_{CC}=6V, I_{OL}=7.8mA$ | | 0.15 | 0.26 | | 0.33 | |
| Input Leakage Current | $I_{I(LEAK)}$ | $V_{CC}=6V, V_{IN}=V_{CC}$ or GND | | ± 0.1 | ± 100 | | ± 1000 | nA |
| Output Leakage Current | $I_{O(LEAK)}$ | $V_{CC}=6V, V_{OUT}=V_{CC}$ or GND | | ± 0.01 | ± 0.5 | | ± 5 | μA |
| Quiescent Supply Current | I_Q | $V_{CC}=6V, V_{IN}=V_{CC}$ or GND, $I_{OUT}=0$ | | | 8 | | 80 | μA |
| Input Capacitance | C_{IN} | $V_{CC}=2V\sim 6V$ | | 3 | 10 | | 10 | pF |

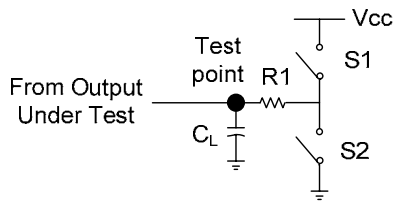
■ SWITCHING CHARACTERISTICS ($t_R, t_F \leq 3ns$)

| PARAMETER | SYMBOL | TEST CONDITIONS | T _A =25 | | | -40~85 | | UNIT |
|--|-------------------------------------|---|--------------------|-----|-----|--------|-----|------|
| | | | MIN | TYP | MAX | MIN | MAX | |
| Propagation delay from input (A) to output(Y) | t _{PLH} / t _{PHL} | V _{CC} =2V, C _L =50 pF | | 35 | 100 | | 125 | ns |
| | | V _{CC} =2V, C _L =150 pF | | 60 | 150 | | 188 | |
| | | V _{CC} =4.5V, C _L =50 pF | | 10 | 20 | | 25 | |
| | | V _{CC} =4.5V, C _L =150 pF | | 15 | 30 | | 38 | |
| | | V _{CC} =6V, C _L =50 pF | | 8 | 17 | | 21 | |
| | | V _{CC} =6V, C _L =150 pF | | 13 | 26 | | 32 | |
| 3-state output enable time from \overline{OE} to Yn | t _{PZH} / t _{PZL} | V _{CC} =2V, C _L =50 pF | | 75 | 150 | | 188 | ns |
| | | V _{CC} =2V, C _L =150 pF | | 100 | 200 | | 250 | |
| | | V _{CC} =4.5V, C _L =50 pF | | 15 | 30 | | 38 | |
| | | V _{CC} =4.5V, C _L =150 pF | | 20 | 40 | | 50 | |
| | | V _{CC} =6V, C _L =50 pF | | 13 | 26 | | 32 | |
| | | V _{CC} =6V, C _L =150 pF | | 17 | 34 | | 43 | |
| 3-state output disable time from \overline{OE} to Yn | t _{PHZ} / t _{PLZ} | V _{CC} =2V, C _L =50 pF | | 40 | 150 | | 188 | ns |
| | | V _{CC} =4.5V, C _L =50 pF | | 18 | 30 | | 38 | |
| | | V _{CC} =6V, C _L =50 pF | | 17 | 26 | | 32 | |

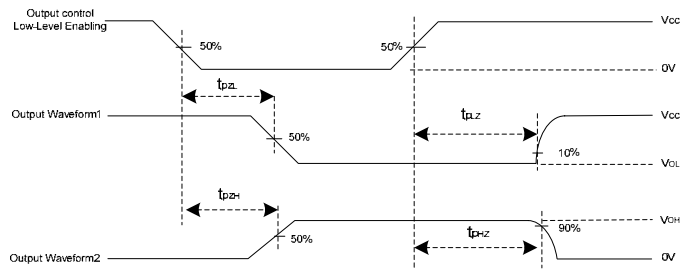
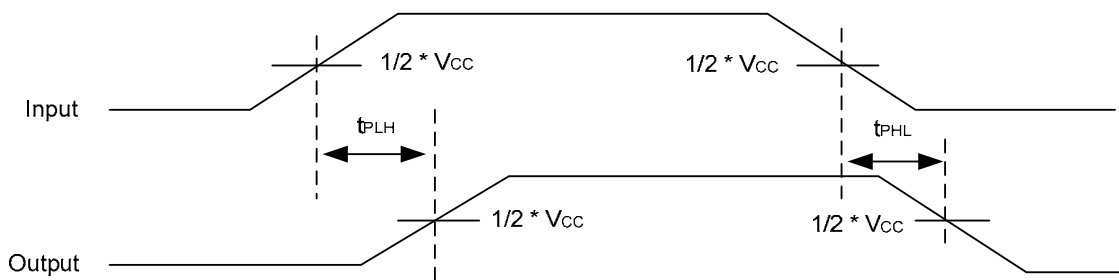
■ OPERATING CHARACTERISTICS

| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|-------------------------------|-----------------|-----------------|-----|-----|-----|------|
| Power Dissipation Capacitance | C _{pd} | No load, f=1MHz | | 35 | | pF |

■ TEST CIRCUIT AND WAVEFORMS



Note: C_L includes probe and jig capacitance.



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