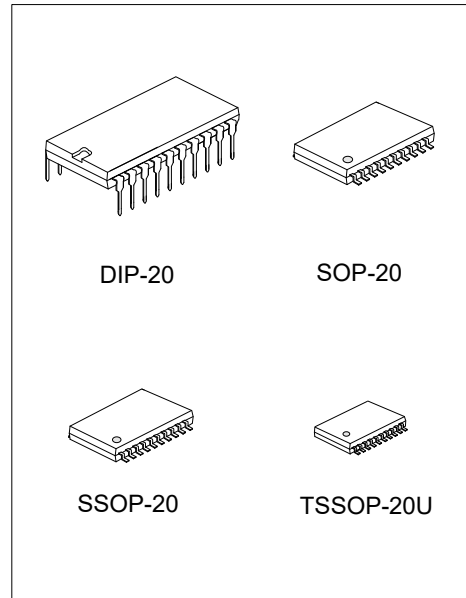




## U74HC573

CMOS IC

### OCTAL TRANSPARENT D-TYPE LATCHES WITH 3-STATE OUTPUTS



#### DESCRIPTION

The UTC **U74HC573** is a octal transparent D-type latch with 3-state outputs, and it has 8 channels.

#### FEATURES

- \* Operate from 2V to 6V
- \* Max t<sub>PD</sub> of 57ns at 4.5 V
- \* Typical V<sub>OL</sub><0.17V at V<sub>CC</sub>=4.5V, T<sub>A</sub>=25°C
- \* Typical V<sub>OH</sub>>4.3V at V<sub>CC</sub>=4.5V, T<sub>A</sub>=25°C

#### ORDERING INFORMATION

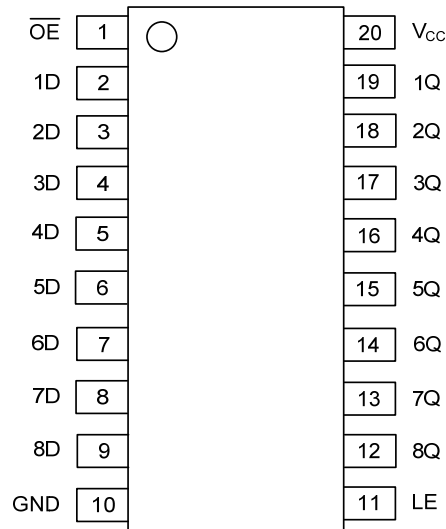
| Ordering Number |                 | Package   | Packing   |
|-----------------|-----------------|-----------|-----------|
| Lead Free       | Halogen Free    |           |           |
| U74HC573L-D20-T | U74HC573G-D20-T | DIP-20    | Tube      |
| U74HC573L-S20-R | U74HC573G-S20-R | SOP-20    | Tape Reel |
| U74HC573L-R20-R | U74HC573G-R20-R | SSOP-20   | Tape Reel |
| U74HC573L-ULA-R | U74HC573G-ULA-R | TSSOP-20U | Tape Reel |

|   |   |
|---|---|
| <p>U74HC573G-D20-T</p> <p>(1) Packing Type<br/>(2) Package Type<br/>(3) Green Package</p> | <p>(1) T: Tube, R: Tape Reel<br/>(2) D20: DIP-20, S20: SOP-20, R20: SSOP-20, ULA: TSSOP-20U<br/>(3) G: Halogen Free and Lead Free, L: Lead Free</p> |
|---|---|

#### MARKING

| DIP-20  | SOP-20 / SSOP-20 / TSSOP-20U  |
|---|---|
| <p>20 19 18 17 16 15 14 13 12 11<br/>           UTC □□□□<br/>           U74HC573□<br/>           □□<br/>           1 2 3 4 5 6 7 8 9 10</p> <p>→ Date Code<br/>           L: Lead Free<br/>           G: Halogen Free<br/>           → Lot Code</p> | <p>20 19 18 17 16 15 14 13 12 11<br/>           UTC □□□□<br/>           U74HC573□<br/>           □□<br/>           1 2 3 4 5 6 7 8 9 10</p> <p>→ Date Code<br/>           L: Lead Free<br/>           G: Halogen Free<br/>           → Lot Code</p> |

## PIN CONFIGURATION

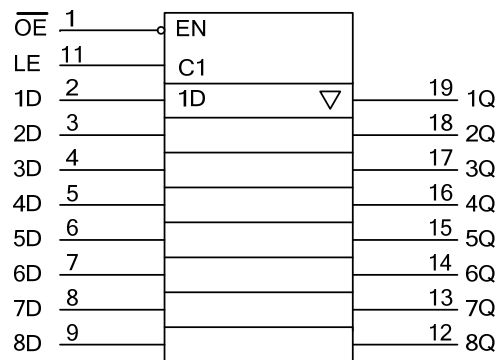


## FUNCTION TABLE

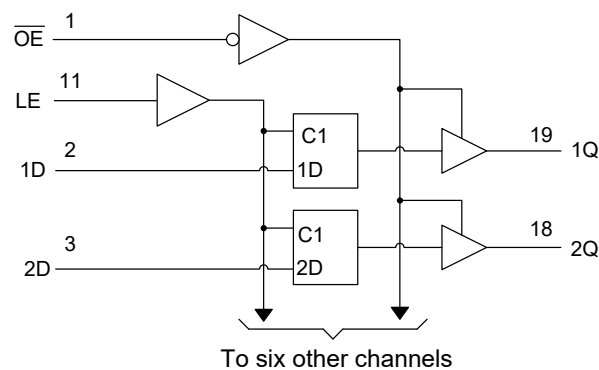
| INPUTS( $\overline{OE}$ ) | INPUTS(LE) | INPUTS(D) | OUTPUT(Q) |
|---------------------------|------------|-----------|-----------|
| L                         | H          | H         | H         |
| L                         | H          | L         | L         |
| L                         | L          | X         | $Q_0$     |
| H                         | X          | X         | Z         |

Note: H: HIGH voltage level; L: LOW voltage level.

## LOGIC SYMBOL



## LOGIC DIAGRAM



■ ABSOLUTE MAXIMUM RATING (Unless otherwise specified)

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

Note: 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 (Unless otherwise specified)

| PARAMETER                | SYMBOL     | TEST CONDITIONS   | MIN  | TYP | MAX      | UNIT        |
|--------------------------|------------|-------------------|------|-----|----------|-------------|
| Supply Voltage           | $V_{CC}$   |                   | 2    | 5   | 6        | V           |
| High-level Input Voltage | $V_{IH}$   | $V_{CC}=2.0V$     | 1.5  |     |          | V           |
|                          |            | $V_{CC}=4.5V$     | 3.15 |     |          | V           |
|                          |            | $V_{CC}=6.0V$     | 4.2  |     |          | V           |
| Low-level Input Voltage  | $V_{IL}$   | $V_{CC}=2.0V$     | 0    |     | 0.5      | V           |
|                          |            | $V_{CC}=4.5V$     | 0    |     | 1.35     | V           |
|                          |            | $V_{CC}=6.0V$     | 0    |     | 1.8      | V           |
| Input Voltage            | $V_{IN}$   |                   | 0    |     | $V_{CC}$ | V           |
| Output Voltage           | $V_{OUT}$  | High or low state | 0    |     | $V_{CC}$ | V           |
| Input Rise or Fall Times | $t_R, t_F$ | $V_{CC}=2.0V$     | 0    |     | 1        | $\mu s$     |
|                          |            | $V_{CC}=4.5V$     | 0    |     | 0.5      | $\mu s$     |
|                          |            | $V_{CC}=6.0V$     | 0    |     | 0.4      | $\mu s$     |
| Operating Temperature    | $T_A$      |                   | -40  |     | +125     | $^{\circ}C$ |

■ THERMAL DATA

| PARAMETER           | SYMBOL    | RATINGS | UNIT          |
|---------------------|-----------|---------|---------------|
| Junction to Ambient | DIP-20    | 90      | $^{\circ}C/W$ |
|                     | SOP-20    | 115     | $^{\circ}C/W$ |
|                     | SSOP-20   | 130     | $^{\circ}C/W$ |
|                     | TSSOP-20U | 135     | $^{\circ}C/W$ |

■ ELECTRICAL CHARACTERISTICS (Unless otherwise specified)

| PARAMETER                      | SYMBOL               | TEST CONDITIONS   | T <sub>A</sub> =25°C |       |      | T <sub>A</sub> =-40~+125°C |     |       | UNIT |
|--------------------------------|----------------------|---|----------------------|-------|------|----------------------------|-----|-------|------|
|                                |                      |   | MIN                  | TYP   | MAX  | MIN                        | TYP | MAX   |      |
| High-level Input Voltage       | V <sub>IH</sub>      | V <sub>CC</sub> =2.0V   | 1.5                  |       |      | 1.5                        |     |       | V    |
|                                |                      | V <sub>CC</sub> =4.5V   | 3.15                 |       |      | 3.15                       |     |       | V    |
|                                |                      | V <sub>CC</sub> =6.0V   | 4.2                  |       |      | 4.2                        |     |       | V    |
| Low-level Input Voltage        | V <sub>IL</sub>      | V <sub>CC</sub> =2.0V   | 0                    |       | 0.5  |                            |     | 0.5   | V    |
|                                |                      | V <sub>CC</sub> =4.5V   | 0                    |       | 1.35 |                            |     | 1.35  | V    |
|                                |                      | V <sub>CC</sub> =6.0V   | 0                    |       | 1.8  |                            |     | 1.8   | V    |
| Output Voltage High-Level      | V <sub>OH</sub>      | V <sub>CC</sub> =2.0V, I <sub>OH</sub> =-20μA                                       | 1.9                  | 1.998 |      | 1.9                        |     |       | V    |
|                                |                      | V <sub>CC</sub> =4.5V, I <sub>OH</sub> =-20μA                                       | 4.4                  | 4.499 |      | 4.4                        |     |       | V    |
|                                |                      | V <sub>CC</sub> =6.0V, I <sub>OH</sub> =-20μA                                       | 5.9                  | 5.999 |      | 5.9                        |     |       | V    |
|                                |                      | V <sub>CC</sub> =4.5V, I <sub>OH</sub> =-6mA  | 3.98                 | 4.3   |      | 3.7                        |     |       | V    |
|                                |                      | V <sub>CC</sub> =6.0V, I <sub>OH</sub> =-7.8mA                                      | 5.48                 | 5.8   |      | 5.2                        |     |       | V    |
| Output Voltage Low-Level       | V <sub>OL</sub>      | V <sub>CC</sub> =2.0V, I <sub>OL</sub> =20μA  |                      | 2     | 100  |                            |     | 100   | mV   |
|                                |                      | V <sub>CC</sub> =4.5V, I <sub>OL</sub> =20μA  |                      | 1     | 100  |                            |     | 100   | mV   |
|                                |                      | V <sub>CC</sub> =6.0V, I <sub>OL</sub> =20μA  |                      | 1     | 100  |                            |     | 100   | mV   |
|                                |                      | V <sub>CC</sub> =4.5V, I <sub>OL</sub> =6mA   |                      | 170   | 260  |                            |     | 400   | mV   |
|                                |                      | V <sub>CC</sub> =6.0V, I <sub>OL</sub> =7.8mA                                       |                      | 150   | 260  |                            |     | 400   | mV   |
| Input Leakage Current          | I <sub>I(LEAK)</sub> | V <sub>CC</sub> =6.0V, V <sub>IN</sub> =V <sub>CC</sub> or GND                      |                      | ±0.1  | ±100 |                            |     | ±1000 | nA   |
| Disable Output Leakage Current | I <sub>OZ</sub>      | V <sub>CC</sub> =6.0V, V <sub>OUT</sub> =V <sub>CC</sub> or GND                     |                      | ±0.01 | ±0.5 |                            |     | ±10   | μA   |
| Quiescent Supply Current       | I <sub>Q</sub>       | V <sub>CC</sub> =6.0V, V <sub>IN</sub> =V <sub>CC</sub> or GND, I <sub>OUT</sub> =0 |                      |       | 8    |                            |     | 160   | μA   |

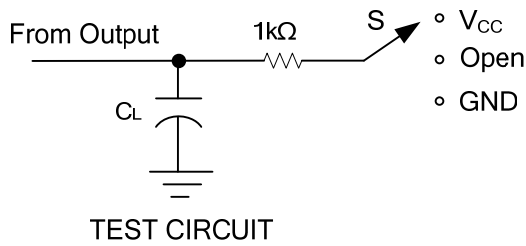
■ SWITCHING CHARACTERISTICS (See TEST CIRCUIT AND WAVEFORMS)

| PARAMETER  | SYMBOL                                       | TEST CONDITIONS                              | T <sub>A</sub> =25°C |     |     | T <sub>A</sub> =-40~+125°C |     |     | UNIT |
|--|--|--|----------------------|-----|-----|----------------------------|-----|-----|------|
|  |  |  | MIN                  | TYP | MAX | MIN                        | TYP | MAX |      |
| Propagation delay from input (D) to output (Q)                   | t <sub>PLH</sub> /t <sub>PHL</sub>           | V <sub>CC</sub> =2.0V, C <sub>L</sub> =50pF  |                      | 77  | 175 |                            |     | 225 | ns   |
|  |  | V <sub>CC</sub> =4.5V, C <sub>L</sub> =50pF  |                      | 26  | 35  |                            |     | 45  | ns   |
|  |  | V <sub>CC</sub> =6.0V, C <sub>L</sub> =50pF  |                      | 23  | 30  |                            |     | 38  | ns   |
|  |  | V <sub>CC</sub> =2.0V, C <sub>L</sub> =150pF |                      | 95  | 200 |                            |     | 255 | ns   |
|  |  | V <sub>CC</sub> =4.5V, C <sub>L</sub> =150pF |                      | 33  | 40  |                            |     | 51  | ns   |
|  |  | V <sub>CC</sub> =6.0V, C <sub>L</sub> =150pF |                      | 21  | 34  |                            |     | 43  | ns   |
| Propagation delay from input (LE) to output (Q)                  |  | V <sub>CC</sub> =2.0V, C <sub>L</sub> =50pF  |                      | 87  | 175 |                            |     | 220 | ns   |
|  |  | V <sub>CC</sub> =4.5V, C <sub>L</sub> =50pF  |                      | 27  | 35  |                            |     | 45  | ns   |
|  |  | V <sub>CC</sub> =6.0V, C <sub>L</sub> =50pF  |                      | 23  | 30  |                            |     | 38  | ns   |
|  |  | V <sub>CC</sub> =2.0V, C <sub>L</sub> =150pF |                      | 103 | 225 |                            |     | 285 | ns   |
|  |  | V <sub>CC</sub> =4.5V, C <sub>L</sub> =150pF |                      | 33  | 45  |                            |     | 58  | ns   |
|  |  | V <sub>CC</sub> =6.0V, C <sub>L</sub> =150pF |                      | 29  | 38  |                            |     | 48  | ns   |
| Output enable time from input ( $\overline{OE}$ ) to output (Q)  | V <sub>CC</sub> =2.0V, C <sub>L</sub> =50pF  |  | 68                   | 150 |     |                            | 210 | ns  |      |
|  | V <sub>CC</sub> =4.5V, C <sub>L</sub> =50pF  |  | 24                   | 30  |     |                            | 42  | ns  |      |
|  | V <sub>CC</sub> =6.0V, C <sub>L</sub> =50pF  |  | 21                   | 26  |     |                            | 36  | ns  |      |
|  | V <sub>CC</sub> =2.0V, C <sub>L</sub> =150pF |  | 85                   | 200 |     |                            | 270 | ns  |      |
|  | V <sub>CC</sub> =4.5V, C <sub>L</sub> =150pF |  | 29                   | 40  |     |                            | 54  | ns  |      |
|  | V <sub>CC</sub> =6.0V, C <sub>L</sub> =150pF |  | 26                   | 34  |     |                            | 47  | ns  |      |
| Output disable time from input ( $\overline{OE}$ ) to output (Q) | V <sub>CC</sub> =2.0V, C <sub>L</sub> =50pF  |  | 47                   | 150 |     |                            | 225 | ns  |      |
|  | V <sub>CC</sub> =4.5V, C <sub>L</sub> =50pF  |  | 23                   | 30  |     |                            | 45  | ns  |      |
|  | V <sub>CC</sub> =6.0V, C <sub>L</sub> =50pF  |  | 21                   | 26  |     |                            | 38  | ns  |      |
| Pulse Width  | t <sub>w</sub>                               | V <sub>CC</sub> =2.0V                        | 80                   |     |     | 120                        |     |     | ns   |
|  |  | V <sub>CC</sub> =4.5V                        | 16                   |     |     | 24                         |     |     | ns   |
|  |  | V <sub>CC</sub> =6.0V                        | 14                   |     |     | 20                         |     |     | ns   |
| Setup Time   | t <sub>SU</sub>                              | V <sub>CC</sub> =2.0V                        | 50                   |     |     | 75                         |     |     | ns   |
|  |  | V <sub>CC</sub> =4.5V                        | 10                   |     |     | 15                         |     |     | ns   |
|  |  | V <sub>CC</sub> =6.0V                        | 9                    |     |     | 13                         |     |     | ns   |
| Hold Time  | t <sub>H</sub>                               | V <sub>CC</sub> =2.0V                        | 20                   |     |     | 24                         |     |     | ns   |
|  |  | V <sub>CC</sub> =4.5V                        | 5                    |     |     | 5                          |     |     | ns   |
|  |  | V <sub>CC</sub> =6.0V                        | 5                    |     |     | 5                          |     |     | ns   |

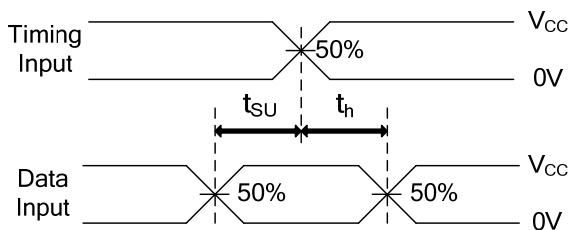
■ OPERATING CHARACTERISTICS (Unless otherwise specified)

| PARAMETER                     | SYMBOL          | TEST CONDITIONS            | MIN | TYP | MAX | UNIT |
|-------------------------------|-----------------|----------------------------|-----|-----|-----|------|
| Input Capacitance             | C <sub>IN</sub> | V <sub>CC</sub> =2.0V~6.0V |     | 3   | 10  | pF   |
| Power Dissipation Capacitance | C <sub>PD</sub> | No load                    |     | 50  |     | pF   |

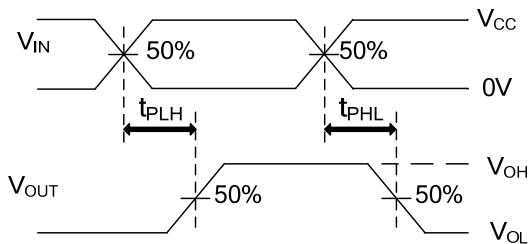
■ TEST CIRCUIT AND WAVEFORMS



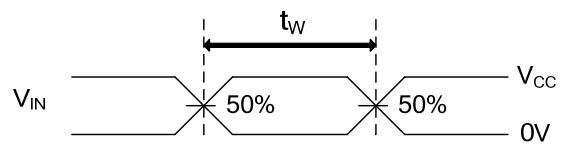
| TEST                               | S               |
|------------------------------------|-----------------|
| t <sub>PLH</sub> /t <sub>PHL</sub> | Open            |
| t <sub>PHZ</sub> /t <sub>PZH</sub> | GND             |
| t <sub>PLZ</sub> /t <sub>PZL</sub> | V <sub>CC</sub> |



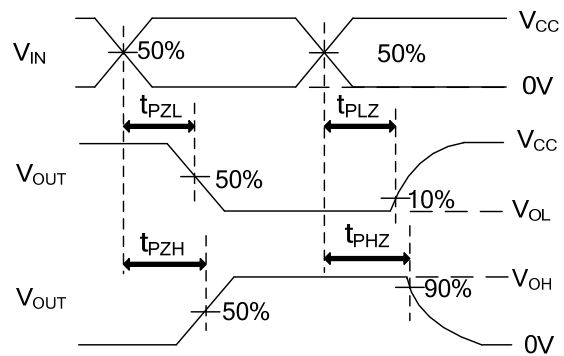
SETUP TIME AND HOLD TIME



PROPAGATION DELAY TIMES



PULSE WIDTH



ENABLE AND DISABLE TIMES

Note: C<sub>L</sub> includes probe and jig capacitance.  
 PRR ≤ 1MHz, Z<sub>o</sub> = 50Ω, t<sub>R</sub> ≤ 6ns, t<sub>F</sub> ≤ 6ns

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