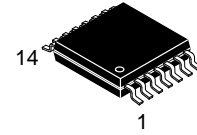


# Low Voltage Dual D-Type Edge-Triggered Flip-Flop

## 74LVX74



TSSOP-14 WB  
CASE 948G

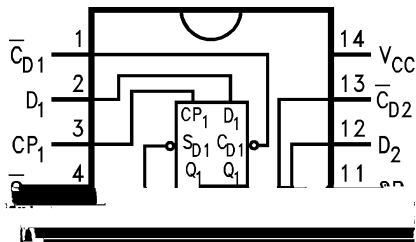
### General Description

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- 
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### Features

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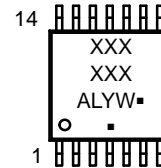
### Connection Diagram



### Pin Description

| Pin Names   | Description         |
|---|---------------------|
| D <sub>1</sub> , D <sub>2</sub>                                       | Data Inputs         |
| CP <sub>1</sub> , CP <sub>2</sub>                                     | Clock Pulse Inputs  |
| $\overline{C}_{D1}$ , $\overline{C}_{D2}$                             | Direct Clear Inputs |
| $\overline{S}_{D1}$ , $\overline{S}_{D2}$                             | Direct Set Inputs   |
| Q <sub>1</sub> , $\overline{Q}_1$ , Q <sub>2</sub> , $\overline{Q}_2$ | Outputs             |

### MARKING DIAGRAM



- XXX = Specific Device Code
- A = Assembly Location
- L = Wafer Lot
- Y = Year
- W = Work Week
- = Pb Free Package

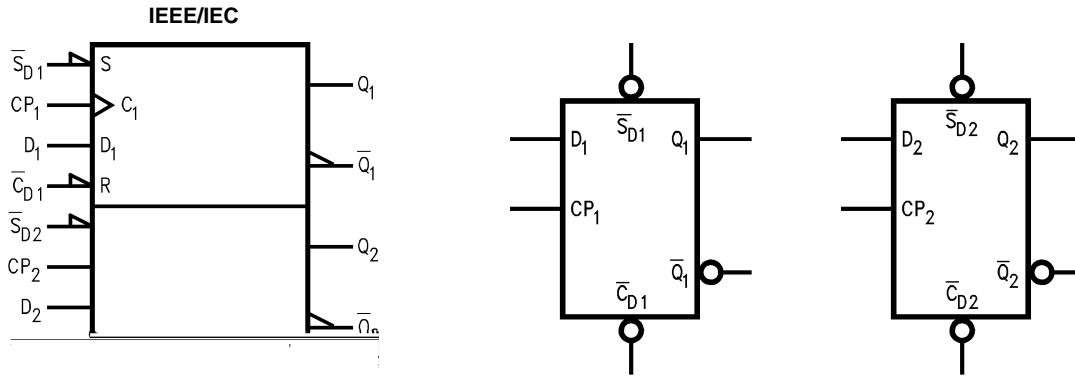
(Note: Microdot may be in either location)

### ORDERING INFORMATION

See detailed ordering and shipping information on page 5 of this data sheet.

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## Logic Symbols



**Truth Table**  
(Each Half)

| Inputs      |             |    |   | Outputs |           |
|-------------|-------------|----|---|---------|-----------|
| $\bar{S}_D$ | $\bar{C}_D$ | CP | D | Q       | $\bar{Q}$ |
| L           | H           | X  | X | H       | L         |
| H           | L           | X  | X | L       | H         |
| L           | L           | X  | X | H       | H         |

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## ABSOLUTE MAXIMUM RATINGS

| Symbol                | Parameter                              | Rating                 | Unit         |    |
|-----------------------|--|------------------------|--------------|----|
| $V_{CC}$              | Supply Voltage                         | -0.5 to +6.5           | V            |    |
| $I_{IK}$              | DC Input Diode Current, $V_I = -0.5$ V | 20                     | mA           |    |
| $V_I$                 | DC Input Voltage                       | -0.5 to +6.5           | V            |    |
| $I_{OK}$              | DC Output Diode Current                | $V_O = -0.5$ V         | 20           | mA |
|                       |  | $V_O = V_{CC} + 0.5$ V | +20          | mA |
| $V_O$                 | DC Output Voltage                      | -0.5 to $V_{CC} + 0.5$ | V            |    |
| $I_O$                 | DC Output Source or Sink Current       | $\pm 25$               | mA           |    |
| $I_{CC}$ or $I_{GND}$ | DC $V_{CC}$ or Ground Current          | $\pm 50$               | mA           |    |
| $T_{STG}$             | Storage Temperature                    | -65 to +150            | $^{\circ}$ C |    |
| $P_D$                 | 50                                     |                        |              |    |

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## DC ELECTRICAL CHARACTERISTICS

| Symbol          | Parameter                 | V <sub>CC</sub> (V) | Conditions   | T <sub>A</sub> = 25°C |     |     | T <sub>A</sub> = -40°C to +85°C |     | Unit |
|-----------------|---------------------------|---------------------|--|-----------------------|-----|-----|---------------------------------|-----|------|
|                 |                           |                     |  | Min                   | Typ | Max | Min                             | Max |      |
| V <sub>IH</sub> | HIGH Level Input Voltage  | 2.0                 |  | 1.5                   |     |     | 1.5                             |     | V    |
|                 |                           | 3.0                 |  | 2.0                   |     |     | 2.0                             |     |      |
|                 |                           | 3.6                 |  | 2.4                   |     |     | 2.4                             |     |      |
| V <sub>IL</sub> | LOW Level Input Voltage   | 2.0                 |  |                       |     | 0.5 |                                 | 0.5 | V    |
|                 |                           | 3.0                 |  |                       |     | 0.8 |                                 | 0.8 |      |
|                 |                           | 3.6                 |  |                       |     | 0.8 |                                 | 0.8 |      |
| V <sub>OH</sub> | HIGH Level Output Voltage | 2.0                 | V <sub>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub> ,<br>I <sub>OH</sub> = -50 μA   | 1.9                   | 2.0 |     | 1.9                             |     | V    |
|                 |                           | 3.0                 | V <sub>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub> ,<br>I <sub>OH</sub> = -50 μA   | 2.9                   | 3.0 |     | 2.9                             |     |      |
|                 |                           |                     | V <sub>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub> ,<br>I <sub>OH</sub> = -4 mA  | 2.58                  |     |     | 2.48                            |     |      |
| V <sub>OL</sub> | LOW Level Output Voltage  | 2.0                 | V <sub>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub> ,<br>I <sub>OL</sub> = 50 μA  |                       | 0.0 | 0.1 |                                 | 0.1 | V    |
|                 |                           | 3.0                 | V <sub>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub> ,<br>I <sub>OL</sub> = 50 μA<br><br>V <sub>IN</sub> = V <sub>IL</sub> |                       | 0.0 | 0.1 |                                 | 0.1 |      |

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## AC ELECTRICAL CHARACTERISTICS

| Symbol                                 | Parameter  | V <sub>CC</sub> (V) | C <sub>L</sub> (pF) | T <sub>A</sub> = 25°C |      |      | T <sub>A</sub> = -40 to 85°C |      | Unit |
|--|--|---------------------|---------------------|-----------------------|------|------|------------------------------|------|------|
|  |  |                     |                     | Min                   | Typ  | Max  | Min                          | Max  |      |
| t <sub>PLH</sub> ,<br>t <sub>PHL</sub> | Propagation Delay<br>C <sub>Pn</sub> to Q <sub>n</sub> or $\bar{Q}_n$                  | 2.7                 | 15                  |                       | 7.3  | 15.0 | 1.0                          | 18.5 | ns   |
|  |  |                     | 50                  |                       | 9.8  | 18.5 | 1.0                          | 22.0 |      |
|  |  | 3.3 ± 0.3           | 15                  |                       | 5.7  | 9.7  | 1.0                          | 11.5 |      |
|  |  |                     | 50                  |                       | 8.2  | 13.2 | 1.0                          | 15.0 |      |
| t <sub>PLH</sub> ,<br>t <sub>PHL</sub> | Propagation Delay<br>$\bar{C}_{Dn}$ to $\bar{S}_{Dn}$ to Q <sub>n</sub> or $\bar{Q}_n$ | 2.7                 | 15                  |                       | 8.4  | 15.6 | 1.0                          | 18.5 | ns   |
|  |  |                     | 50                  |                       | 10.9 | 19.1 | 1.0                          | 22.0 |      |
|  |  | 3.3 ± 0.3           | 15                  |                       | 6.6  | 10.1 |                              |      |      |
|  |  |                     | 50                  |                       | 9.1  | 13.6 |                              |      |      |



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