

Product Features

- Functionally compatible with FCT3, LVT, and 74 series 241 families of products
- Tri-State outputs
- 5V Tolerant inputs and outputs
- 2.0V-3.6V V_{CC} supply operation
- Balanced sink and source output drives (24 mA)
- Low ground bounce outputs
- Power Down High Impedance inputs and outputs
- Supports live insertion
- ESD Protection exceeds 2000V, Human Body Model
200V, Machine Model
- Packages available:
 - 20-pin 173-mil wide plastic TSSOP (L)
 - 20-pin 150-mil wide plastic QSOP (Q)
 - 20-pin 300-mil wide plastic SOIC (S)

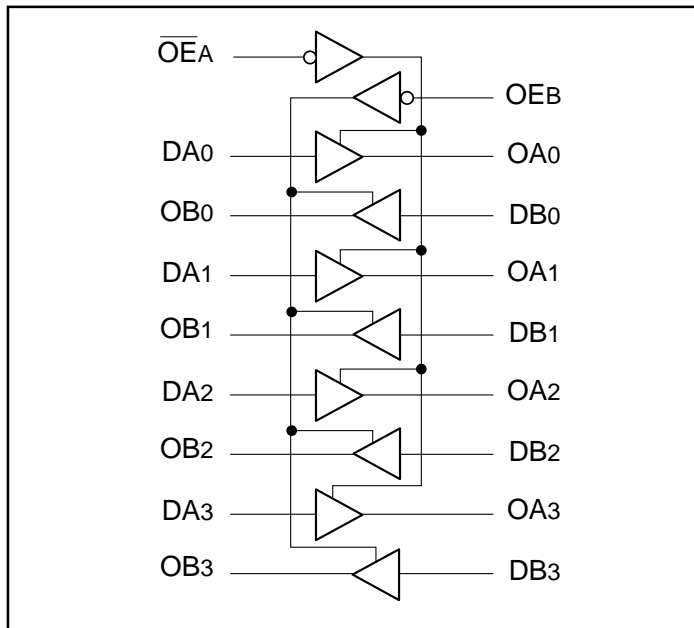
Product Description

Pericom Semiconductor's PI74LCX series of logic circuits are produced using the Company's advanced 0.6 micron CMOS technology achieving high speed while maintaining low power operation.

The PI74LCX241 is an 8-bit buffer/line driver designed for driving high capacitive memory loads. With its balanced-drive characteristics, this high-speed, low power device provides lower ground bounce, transmission line matching of signals, fewer line reflections and lower EMI and RFI effects. This makes it ideal for driving on-board buses and transmission lines.

The PI74LCX241 can be driven from either 3.3V or 5.0V devices allowing this device to be used as a translator in a mixed 3.3V/5.0V system.

Logic Block Diagram

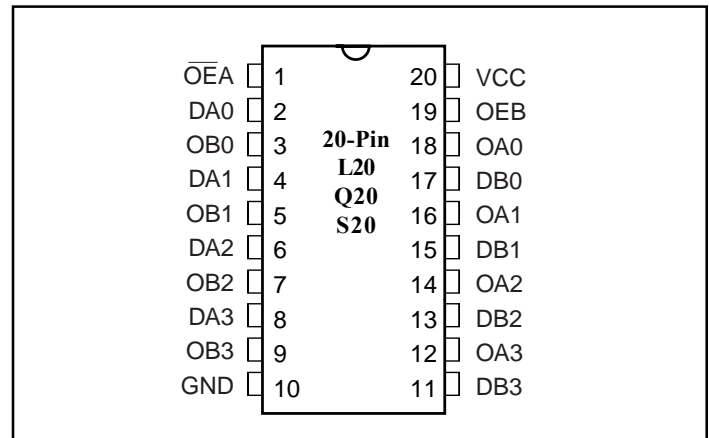


Truth Table⁽¹⁾

| Inputs | | | Outputs |
|-------------------|--------|-----------------|-----------------|
| \overline{OE}_A | OE_B | D _{xx} | O _{xx} |
| L | L | L | L |
| L | L | H | H |
| H | H | X | Z |

Note:
 1. H = High Voltage Level,
 X = Don't Care,
 L = Low Voltage Level,
 Z = High Impedance

Product Pin Configuration



Product Pin Description

| Pin Name | Description |
|---------------------|--|
| \overline{OE}_A , | 3-State Output Enable Inputs (Active LOW) |
| OE_B , | 3-State Output Enable Inputs (Active HIGH) |
| D _{xx} | Inputs |
| O _{xx} | Outputs |
| GND | Ground |
| V _{cc} | Power |

Maximum Ratings

(Above which the useful life may be impaired. For user guidelines, not tested.)

| | |
|--|-----------------|
| Storage Temperature | -65°C to +150°C |
| Ambient Temperature with Power Applied | -40°C to +85°C |
| Supply Voltage to Ground Potential (Inputs & Vcc Only) | -0.5V to +7.0V |
| Supply Voltage to Ground Potential (Outputs & D/O Only) .. | -0.5V to +7.0V |
| DC Input Voltage | -0.5V to +7.0V |
| DC Output Current | 120 mA |
| Power Dissipation | 1.0W |

Note:

Stresses greater than those listed under MAXIMUM RATINGS may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.

Recommended Operating Conditions

| Symbol | Parameter | Min. | Max. | Units | | |
|----------------------------------|--------------------------------|---------------------------------------|------|-----------------|----|------|
| V _{CC} | Supply Voltage | Operating | 2.0 | 3.6 | V | |
| | | Data Retention | 1.5 | 3.6 | | |
| V _I | Input Voltage | 0 | 5.5 | | | |
| V _O | Output Voltage | HIGH or LOW State | 0 | V _{CC} | | |
| | | TRI-State | 0 | 5.5 | | |
| I _{OH} /I _{OL} | Output Current | V _{CC} = 3.0V-3.6V | — | ±24 | mA | |
| | | V _{CC} = 2.7V | — | ±12 | | |
| T _A | Free-Air Operating Temperature | -40 | +85 | °C | | |
| Δt/ΔV | Input Edge Rate | V = 0.8V-2.0V, V _{CC} = 3.0V | | 0 | 10 | ns/V |

DC Electrical Characteristics (Over the Operating Range, $T_A = -40^{\circ}\text{C}$ to $+85^{\circ}\text{C}$, $V_{CC} = 2.7\text{V}$ to 3.6V)

| Parameters | Description | Test Conditions ⁽¹⁾ | | Min. | Typ ⁽²⁾ | Max. | Units |
|-----------------|---|---|---------------------------------------|--------------|--------------------|---------|---------------|
| V_{IH} | Input HIGH Voltage | Guaranteed Logic HIGH Level | | 2.0 | — | — | V |
| V_{IL} | Input LOW Voltage | Guaranteed Logic LOW Level | | — | — | 0.8 | |
| V_{OH} | Output HIGH Voltage | $V_{CC} = 2.7\text{-}3.6$ | $I_{OH} = -0.1\text{mA}$ | $V_{CC}-0.2$ | — | — | |
| | | $V_{CC} = 2.7$ | $I_{OH} = -12\text{mA}$ | 2.2 | — | — | |
| | | $V_{CC} = 3.0$ | $I_{OH} = -18\text{mA}$ | 2.4 | — | — | |
| | | | $I_{OH} = -24\text{mA}$ | 2.2 | — | — | |
| V_{OL} | Output LOW Voltage | $V_{CC} = 2.7\text{-}3.6$ | $I_{OL} = 0.1\text{mA}$ | — | — | 0.2 | |
| | | $V_{CC} = 2.7$ | $I_{OL} = 12\text{mA}$ | — | — | 0.4 | |
| | | $V_{CC} = 3.0$ | $I_{OL} = 16\text{mA}$ | — | — | 0.4 | |
| | | | $I_{OL} = 24\text{mA}$ | — | — | 0.55 | |
| V_{IK} | Clamp Diode Voltage | $V_{CC} = \text{Min.}, I_{IN} = -18\text{mA}$ | | — | -0.7 | -1.2 | |
| I_I | Input Leakage Current | $0 \leq V_I \leq 5.5\text{V}$ | $V_{CC} = 2.7\text{-}3.6$ | — | — | ± 5 | μA |
| I_{OZ} | Tri-State Output Leakage | $0 \leq V_O \leq 5.5\text{V}$ $V_I = V_{IH}$ or V_{IL} | $V_{CC} = 2.7\text{-}3.6$ | — | — | ± 5 | |
| I_{OFF} | Power Down Disable | $V_{CC} = 0\text{V}, V_{IN}$ or $V_{OUT} \leq 5.5\text{V}$ | | — | — | 10 | |
| I_{CC} | Quiescent Power Supply Current | $V_{CC} = \text{Max.}$ | $V_{IN} = \text{GND}$ or V_{CC} | — | 0.1 | 10 | |
| ΔI_{CC} | Quiescent Power Supply Current TTL Inputs HIGH | $V_{CC} = \text{Max.}$ | $V_{IN} = V_{CC} - 0.6\text{V}^{(3)}$ | — | — | 500 | |

Notes:

1. For Max. or Min. conditions, use appropriate value specified under Electrical Characteristics for the applicable device type.
2. Typical values are at $V_{CC} = 3.3\text{V}$, $+25^{\circ}\text{C}$ ambient.
3. Per TTL driven input; all other inputs at V_{CC} or GND.

Capacitance

| Parameters | Description | Test Conditions | Typ. | Units |
|------------|-------------------------------|---|------|-------|
| C_{IN} | Input Capacitance | $V_{CC} = \text{Open}, V_I = 0\text{V}$ or V_{CC} | 7 | pF |
| C_{OUT} | Output Capacitance | $V_{CC} = 3.3\text{V}, V_I = 0\text{V}$ or V_{CC} | 8 | |
| C_{PD} | Power Dissipation Capacitance | $V_{CC} = 3.3\text{V}, V_I = 0\text{V}$ or $V_{CC}, F = 10\text{MHz}$ | 25 | |

Switching Characteristics over Operating Range

| Parameters | Description | Conditions | V _{CC} = 3.3V ± 0.3V | | V _{CC} = 2.7V | | Units |
|--------------------------------------|---|--|-------------------------------|------|------------------------|------|-------|
| | | | Min. | Max. | Min. | Max. | |
| t _{PLH} t _{PHL} | Propagation Delay D _{XX} to O _{XX} | C _L = 50pF R _L = 500Ω | 1.5 | 6.5 | 1.5 | 7.5 | ns |
| t _{PZH} t _{PZL} | Output Enable time | | 1.5 | 8.0 | 1.5 | 9.0 | |
| t _{PHZ} t _{PLZ} | Output Disable Time | | 1.5 | 7.0 | 1.5 | 8.0 | |
| t _{SK(O)} | Output Skew ⁽¹⁾ | | — | 1.0 | — | — | |

Note:

1. Skew between any two outputs, of the same package, switching in the same direction.

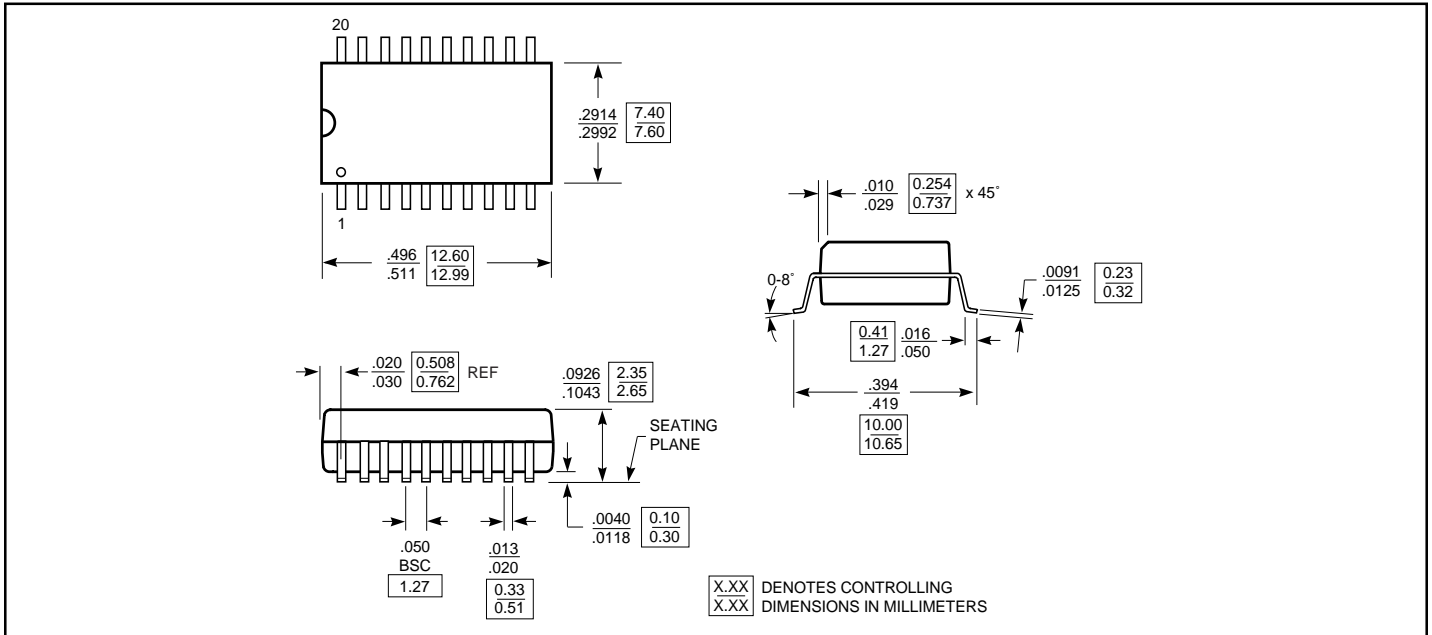
Dynamic Switching Characteristics (T_A = +25°C)

| Parameters | Description | Test Conditions ⁽¹⁾ | Typ. | Units |
|------------------|----------------------------|--|------|-------|
| V _{OLP} | Dynamic LOW Peak Voltage | V _{CC} = 3.3V, C _L = 50 pF V _{IH} = 3.3V, V _{IL} = 0V | 0.8 | V |
| V _{OLV} | Dynamic LOW Valley Voltage | V _{CC} = 3.3V, C _L = 50 pF V _{IH} = 3.3V, V _{IL} = 0V | | |

Note:

1. Measured with n-1 outputs switching from HIGH-to-LOW or LOW-to-HIGH. The remaining output is measured in the LOW state.

Packaging Mechanical - 20-pin SOIC (S-package)



Packaging Mechanical - 20-pin TSSOP (L-package)

