

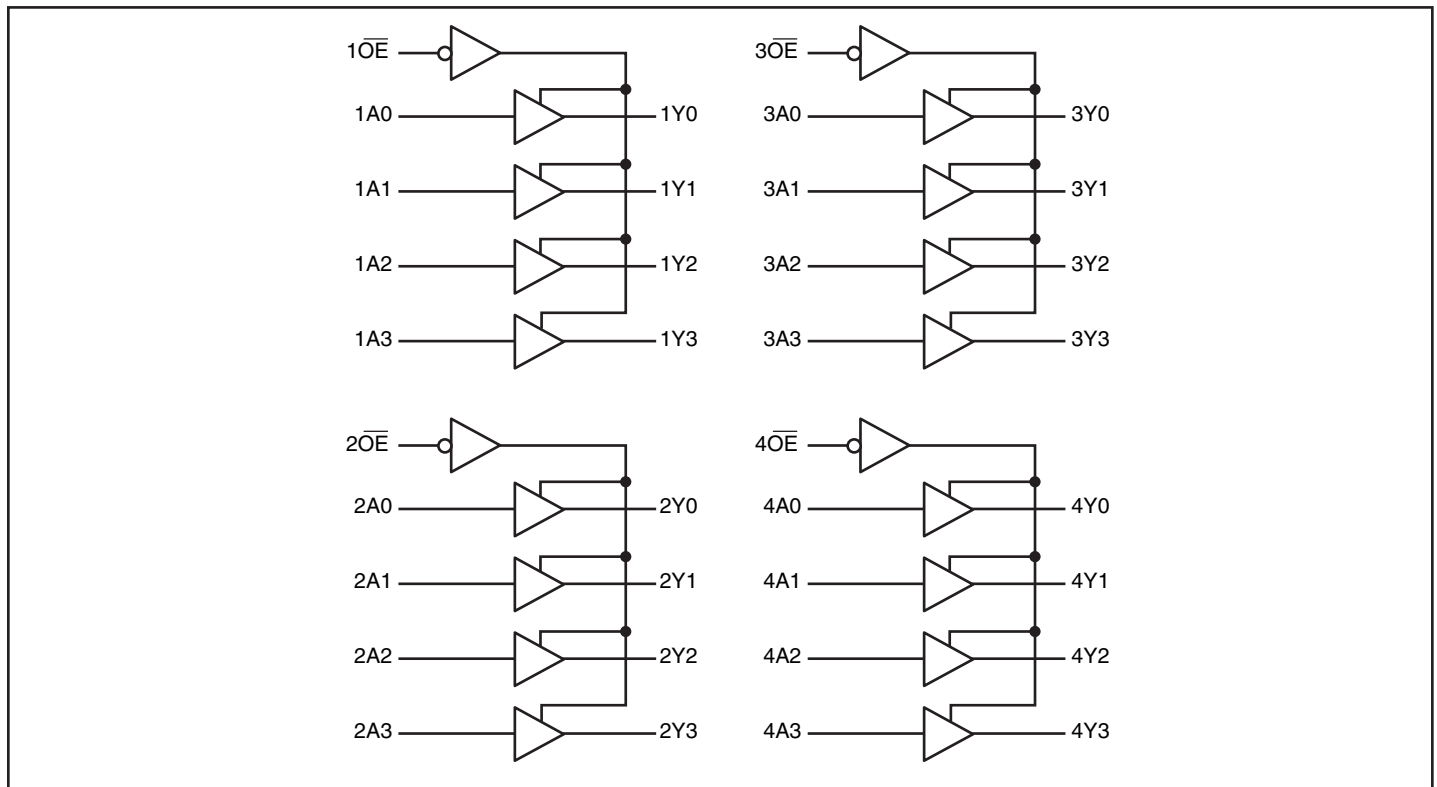
**Fast CMOS 3.3V 16-Bit Buffer/Line Driver**
**Features**

- Functionally compatible with FCT3, LVT, and 74 series 16244 families of products
- 3-State outputs
- 5V Tolerant inputs and outputs
- 2.0V – 3.6V  $V_{DD}$  supply operation
- Balanced sink and source output drives (24mA)
- Low ground bounce outputs
- Power Down High Impedance inputs and outputs
- Supports live insertion
- ESD Protection exceeds 2000V, Human Body Model  
200V, Machine Model
- Packaging (Pb-free & Green Available):
  - 48-pin 300-mil wide plastic SSOP (V)
  - 48-pin 240-mil wide plastic TSSOP (A)

**Description**

Pericom Semiconductor's PI74LCX16244 is a 16-bit buffer/line driver designed for driving 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. This device is designed with three-state controls to operate in a Quad-Nibble, Dual-Byte, or a single 16-bit word mode.

The PI74LCX16244 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.

**Block Diagram**


### 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 & V <sub>DD</sub> 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

| Parameter                        | Description           |                                         | Min. | Max.            | Units |
|----------------------------------|-----------------------|-----------------------------------------|------|-----------------|-------|
| V <sub>DD</sub>                  | Supply Voltage        | Operating                               | 2.0  | 3.6             | V     |
|                                  |                       | Data Retention                          | 1.5  | 3.6             |       |
| V <sub>I</sub>                   | Input Voltage         |                                         | 0    | 5.5             |       |
| V <sub>O</sub>                   | Output Voltage        | HIGH or LOW state                       | 0    | V <sub>DD</sub> |       |
|                                  |                       | 3-state                                 | 0    | 5.5             |       |
| I <sub>OH</sub> /I <sub>OL</sub> | Output Current        | V <sub>DD</sub> = 3.0V - 3.6V           |      | ±24             | mA    |
|                                  |                       | V <sub>DD</sub> = 2.7V                  |      | ±12             |       |
| T <sub>A</sub>                   | Operating Temperature |                                         | -40  | 85              | °C    |
| Δt/ΔV                            | Input Edge Rate       | V = 0.8V - 2.0V, V <sub>DD</sub> = 3.0V | 0    | 10              | ns/V  |

### Pin Description

| Pin Name         | Description                               |
|------------------|-------------------------------------------|
| $\overline{xOE}$ | 3-State Output Enable Inputs (Active LOW) |
| $xAX$            | Inputs                                    |
| $xYX$            | 3-State Outputs                           |
| GND              | Ground                                    |
| $V_{DD}$         | Power                                     |

### Truth Table<sup>(1)</sup>

| Inputs           |       | Output |
|------------------|-------|--------|
| $\overline{xOE}$ | $xAX$ | $xYX$  |
| L                | L     | L      |
| L                | H     | H      |
| H                | X     | Z      |

#### Notes:

- H = High Voltage Level, X = Don't Care,  
L = Low Voltage Level, Z = High Impedance

### Pin Configuration

|                  |    |    |                  |
|------------------|----|----|------------------|
| $\overline{1OE}$ | 1  | 48 | $\overline{2OE}$ |
| $1Y_0$           | 2  | 47 | $1A_0$           |
| $1Y_1$           | 3  | 46 | $1A_1$           |
| GND              | 4  | 45 | GND              |
| $1Y_2$           | 5  | 44 | $1A_2$           |
| $1Y_3$           | 6  | 43 | $1A_3$           |
| $V_{DD}$         | 7  | 42 | $V_{DD}$         |
| $2Y_0$           | 8  | 41 | $2A_0$           |
| $2Y_1$           | 9  | 40 | $2A_1$           |
| GND              | 10 | 39 | GND              |
| $2Y_2$           | 11 | 38 | $2A_2$           |
| $2Y_3$           | 12 | 37 | $2A_3$           |
| $3Y_0$           | 13 | 36 | $3A_0$           |
| $3Y_1$           | 14 | 35 | $3A_1$           |
| GND              | 15 | 34 | GND              |
| $3Y_2$           | 16 | 33 | $3A_2$           |
| $3Y_3$           | 17 | 32 | $3A_3$           |
| $V_{DD}$         | 18 | 31 | $V_{DD}$         |
| $4Y_0$           | 19 | 30 | $4A_0$           |
| $4Y_1$           | 20 | 29 | $4A_1$           |
| GND              | 21 | 28 | GND              |
| $4Y_2$           | 22 | 27 | $4A_2$           |
| $4Y_3$           | 23 | 26 | $4A_3$           |
| $\overline{4OE}$ | 24 | 25 | $\overline{3OE}$ |

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

| Parameters      | Description                                       | Test Conditions <sup>(1)</sup>                              |                                       | Min.           | Typ. <sup>(2)</sup> | 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                               | $V_{DD} = 2.7 - 3.6$                                        | $I_{OH} = -0.1\text{mA}$              | $V_{DD} - 0.2$ |                     |         |               |
|                 |                                                   | $V_{DD} = 2.7$                                              | $I_{OH} = -12\text{mA}$               | 2.2            |                     |         |               |
|                 |                                                   | $V_{DD} = 3.0$                                              | $I_{OH} = -18\text{mA}$               | 2.4            |                     |         |               |
|                 |                                                   |                                                             | $I_{OH} = -24\text{mA}$               | 2.2            |                     |         |               |
| $V_{OL}$        | Output LOW Voltage                                | $V_{DD} = 2.7 - 3.6$                                        | $I_{OL} = 0.1\text{mA}$               |                |                     | 0.2     |               |
|                 |                                                   | $V_{DD} = 2.7$                                              | $I_{OL} = 12\text{mA}$                |                |                     | 0.4     |               |
|                 |                                                   | $V_{DD} = 3.0$                                              | $I_{OL} = 16\text{mA}$                |                |                     | 0.4     |               |
|                 |                                                   |                                                             | $I_{OL} = 24\text{mA}$                |                |                     | 0.55    |               |
| $V_{IK}$        | Clamp Diode Voltage                               | $V_{DD} = \text{Min.}, I_{IN} = -18\text{mA}$               |                                       |                | -0.7                | -1.2    |               |
| $I_I$           | Input Leakage Current                             | $0 \leq V_I \leq 5.5\text{V}$                               | $V_{DD} = 2.7 - 3.6$                  |                |                     | $\pm 5$ | $\mu\text{A}$ |
| $I_{OZ}$        | Tri-State Output Leakage                          | $0 \leq V_O \leq 5.5\text{V}$<br>$V_I = V_{IH}$ or $V_{IL}$ | $V_{DD} = 2.7 - 3.6$                  |                |                     | $\pm 5$ |               |
| $I_{OFF}$       | Power Down Disable                                | $V_{DD} = 0\text{V}, V_{IN}$ or $V_{OUT} \leq 5.5\text{V}$  |                                       |                |                     | 10      |               |
| $I_{DD}$        | Quiescent Power supply current                    | $V_{DD} = \text{Max.}$                                      | $V_{IN} = \text{GND}$ or $V_{DD}$     |                | 0.1                 | 10      |               |
| $\Delta I_{DD}$ | Quiescent Power supply current<br>TTL Inputs High | $V_{DD} = \text{Max.}$                                      | $V_{IN} = V_{DD} = 0.6\text{V}^{(3)}$ |                |                     | 500     |               |

**Notes:**

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

**Capacitance**

| Parameters | Description                   | Test Conditions                                                       | Typ. | Units |
|------------|-------------------------------|-----------------------------------------------------------------------|------|-------|
| $C_{IN}$   | Input Capacitance             | $V_{DD} = \text{Open}, V_I = 0\text{V}$ or $V_{DD}$                   | 3    | pF    |
| $C_{OUT}$  | Output Capacitance            | $V_{DD} = 3.3\text{V}, V_I = 0\text{V}$ or $V_{DD}$                   | 3    |       |
| $C_{PD}$   | Power Dissipation Capacitance | $V_{DD} = 3.3\text{V}, V_I = 0\text{V}$ or $V_{DD}, F = 10\text{MHz}$ | 20   |       |

**Switching Characteristics over Operating Range**

| Parameters         | Description                                           | Test Conditions                                | V <sub>DD</sub> = 3.3V±0.3 |      | V <sub>DD</sub> = 2.7V |      | Units |
|--------------------|-------------------------------------------------------|------------------------------------------------|----------------------------|------|------------------------|------|-------|
|                    |                                                       |                                                | Min.                       | Max. | Min.                   | Max. |       |
| t <sub>PHL</sub>   | Propagation Delay, D <sub>XX</sub> to O <sub>XX</sub> | C <sub>L</sub> = 50pF<br>R <sub>L</sub> = 500Ω | 1.5                        | 4.5  | 1.5                    | 5.2  | ns    |
| t <sub>PZH</sub>   | Output Enable time                                    |                                                | 1.5                        | 5.5  | 1.5                    | 6.3  |       |
| t <sub>PHZ</sub>   | Output Disable time                                   |                                                | 1.5                        | 5.4  | 1.5                    | 5.7  |       |
| t <sub>sk(0)</sub> | Output Skew <sup>(1)</sup>                            |                                                |                            | 1.0  |                        |      |       |

**Notes:**

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

**Dynamic Switching Characteristics (T<sub>A</sub> = +25°C)**

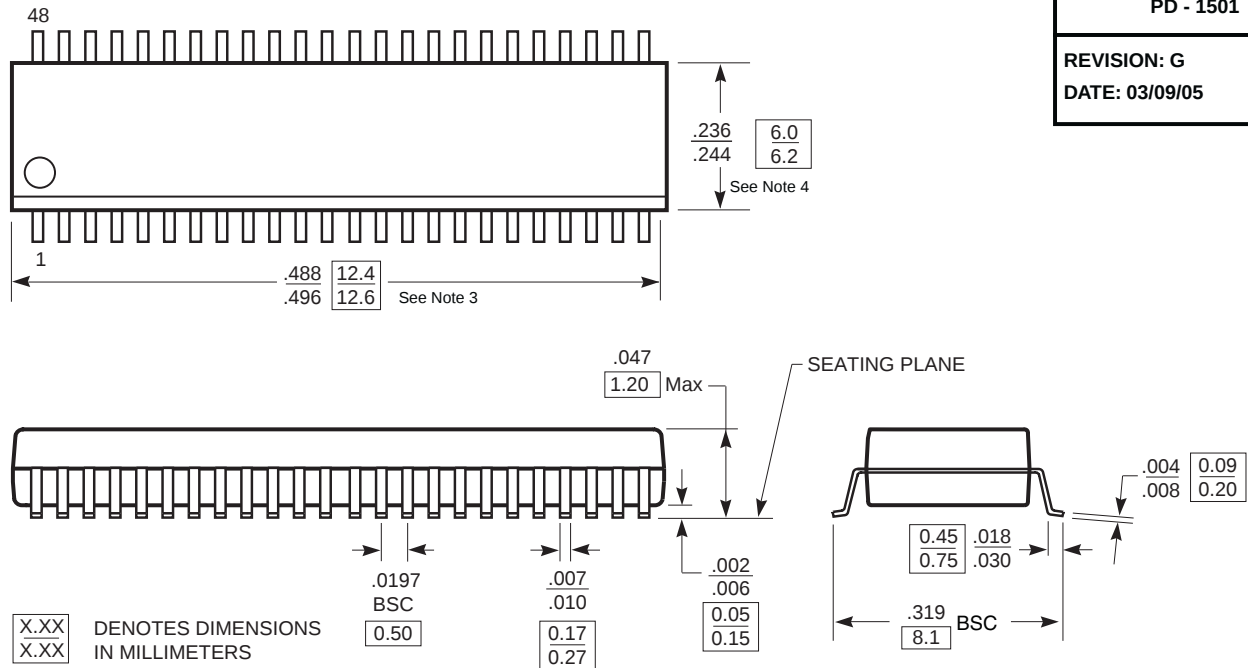
| Parameters       | Description                | Test Conditions <sup>(1)</sup>                                                                 | Typ. | Units |
|------------------|----------------------------|------------------------------------------------------------------------------------------------|------|-------|
| V <sub>OLP</sub> | Dynamic LOW peak voltage   | V <sub>DD</sub> = 3.3V, C <sub>L</sub> = 50pF,<br>V <sub>IH</sub> = 3.3V, V <sub>IL</sub> = 0V | 0.8  | V     |
| V <sub>OLV</sub> | Dynamic LOW valley voltage |                                                                                                |      |       |

**Notes:**

1. Measured with 15 outputs switching from High-to-Low or Low-to-High. The remaining output is measured in the LOW state.

DOCUMENT CONTROL NO.  
PD - 1501

REVISION: G  
DATE: 03/09/05



**Note:**

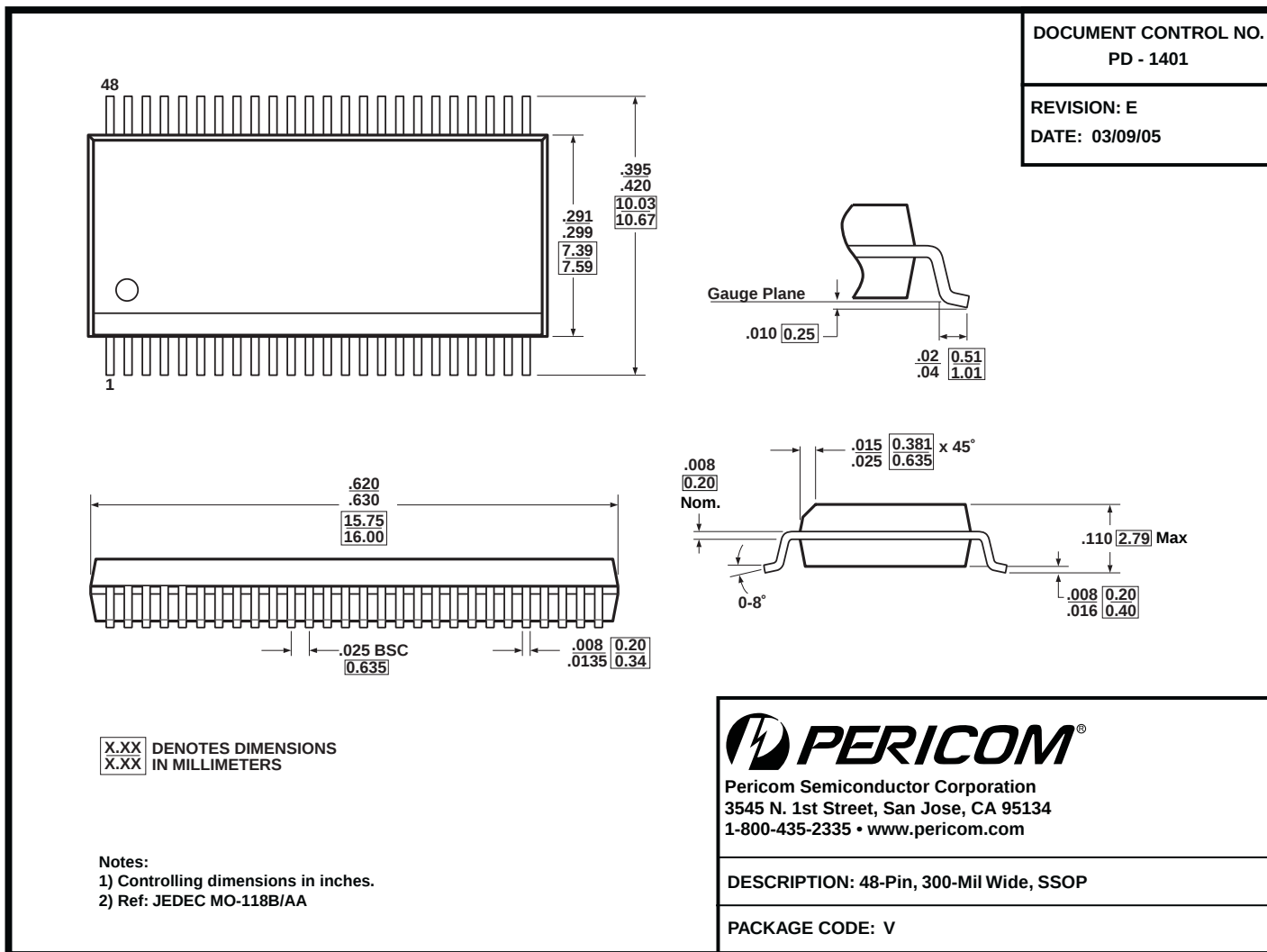
- Controlling dimensions in millimeters.
- Ref: JEDEC MO-153F/ED
- Dimension does not include mold flash, protrusions or gate burrs. Mold flash, protrusions and gate burrs shall not exceed 0.15mm per side.
- Dimension does not include interlead flash or protrusion. Interlead flash or protrusion shall not exceed 0.25mm per side.



Pericom Semiconductor Corporation  
3545 N. 1st Street, San Jose, CA 95134  
1-800-435-2335 • www.pericom.com

DESCRIPTION: 48-Pin 240-Mil Wide TSSOP

PACKAGE CODE: A


**Note:**

- For latest package info, please check: <http://www.pericom.com/products/packaging/mechanicals.php>

**Ordering Information**

| Ordering Code   | Package Code | Package Description                                |
|-----------------|--------------|----------------------------------------------------|
| PI74LCX16244AEX | A            | Pb-free & Green, 48-pin 240 mil wide Plastic TSSOP |
| PI74LCX16244VEX | V            | Pb-free & Green, 48-pin 300-mil wide plastic SSOP  |

**Notes:**

- Thermal characteristics can be found on the company web site at [www.pericom.com/packaging/](http://www.pericom.com/packaging/)
- E = Pb-free & Green
- Adding an X suffix = Tape/Reel