

**Features**

- 140MHz operation (PI6CV2304)
- 160MHz operation (PI6CV304)
- Low noise, low skew: 150ps max
- Fast rise/fall time: 1.0ns typ.
- Fast propagation delay: 2.0ns typ.
- 5V I/O tolerant input
- Industrial temperature (−40°C to 85°C)
- 3.3V power supply
- Packaging (Pb-free & Green available)
  - 8-pin TSSOP (L)
  - 8-pin SOIC (W)

**Applications**

- 33 MHz PCI-to-133 MHz PCIX controllers
- 80 MHz for 10/100 Mbps Ethernet
- 125 MHz for Gigabit networking
- 155 MHz for Optical OC3/SDH/SONET

**Description**

Pericom’s PI6CV304 and PI6CV2304 are low-skew, low-noise, high-speed clock buffers and are ideal for computing, networking, and communication applications. Application examples include PCI(X) clock buffers in servers and workstations, PCI(X) Storage Area Network (SAN), and RAID controllers. They are used for networking and communications applications requiring 80 MHz for 10/100 Mbps Ethernet and 125 MHz for Gigabit networking clocks.

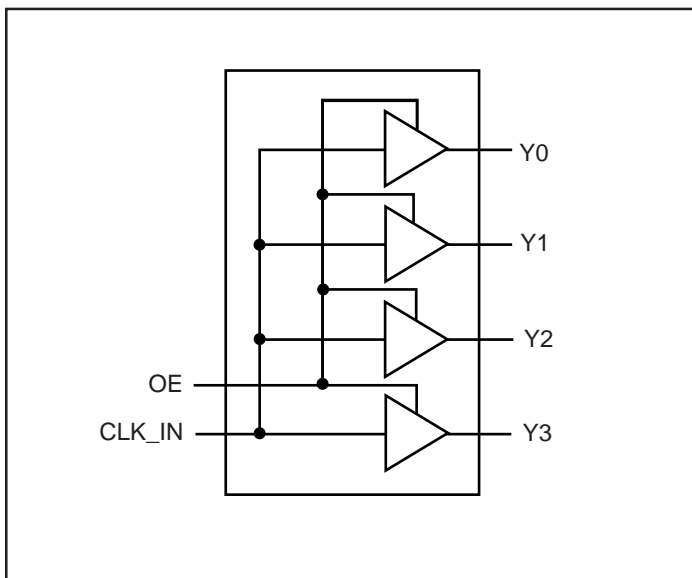
To reduce EMI emission and power consumption, all outputs can be disabled to 3-state by asserting a low signal to the OE (Output Enable) pin.

PI6CV2304 output impedance is 30-ohms. PI6CV304 output impedance is 20-ohms.

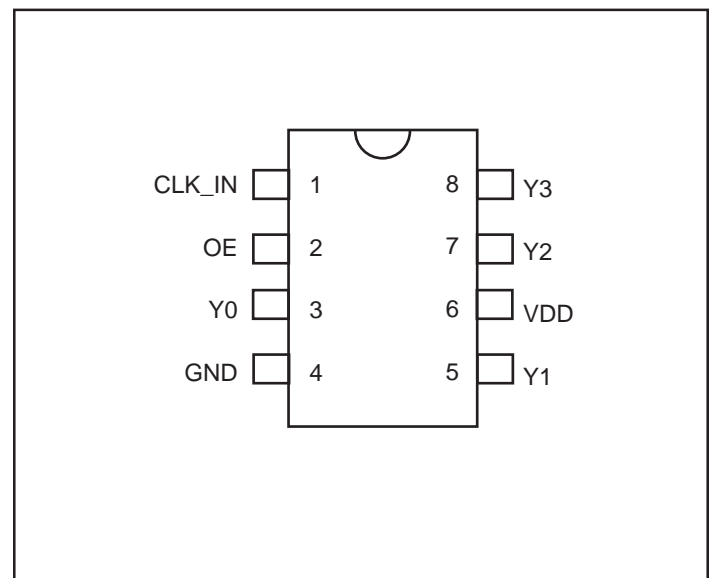
**Function Table**

| Inputs |    | Output |
|--------|----|--------|
| CLK_IN | OE | Y[0:3] |
| X      | L  | Z      |
| L      | H  | L      |
| H      | H  | H      |

**Block Diagram**



**Pin Configuration**



**Pin Description**

| Pin #   | Symbol          | Type   | Qty | Description   |
|---------|-----------------|--------|-----|---|
| 1       | CLK_IN          | Input  | 1   | 5V Tolerant clock input   |
| 2       | OE              | Input  | 1   | Active High Output Enable. Y[0-3] outputs will be 3-stated when OE is low |
| 3,5,7,8 | Y[0-3]          | Output | 4   | LVC MOS level outputs   |
| 4       | GND             | Ground | 1   | Ground  |
| 6       | V <sub>DD</sub> | Power  | 1   | 3.3V power  |

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

|  |                                |
|--|--------------------------------|
| Supply Voltage (V <sub>DD</sub> )                | -0.0V to +5.0V                 |
| Input Voltage                                    | -0.5V to V <sub>DD</sub> +0.5V |
| Industrial Operating Temperature                 | -40°C to +85°C                 |
| Storage Temperature                              | -65°C to +150°C                |
| Junction Temperature                             | 150°C                          |
| Input ESD MIL-883, method 3015, human body model | 2KV                            |

**Operating Conditions**

| Symbol          | Description                    | Min | Max | Unit |
|-----------------|--------------------------------|-----|-----|------|
| V <sub>DD</sub> | I/O Supply, Analog Core Supply | 3.0 | 3.6 | V    |
| T <sub>A</sub>  | Industrial Ambient Temperature | -40 | +85 | °C   |

**PI6CV304 DC Characteristics Over Operating Conditions**

| Symbol   | Parameter           | Conditions                      | Min | Typ. | Max | Units    |
|----------|---------------------|---------------------------------|-----|------|-----|----------|
| $V_{IL}$ | Low Input Voltage   |                                 |     |      | 0.8 | V        |
| $V_{IH}$ | High Input Voltage  |                                 | 2.0 |      |     |          |
| $I_{IL}$ | Low Input Current   | $V_{IN} = 0V$                   |     |      | -5  | $\mu A$  |
| $I_{IH}$ | High Input Current  | $V_{IN} = V_{DD}$               |     |      | 5   |          |
| $V_{OL}$ | Low Output Voltage  | $V_{DD} = 3.0V, I_{OL} = 12mA$  |     |      | 0.4 | V        |
| $V_{OH}$ | High Output Voltage | $V_{DD} = 3.0V, I_{OH} = -12mA$ | 2.4 |      |     |          |
| $C_O$    | Output Capacitance  |                                 |     |      | 7   | pF       |
| $C_I$    | Input Capacitance   |                                 |     |      | 5   |          |
| $I_{DD}$ | Supply Current      | $C_L = 33pF/33MHz$              |     | 20   |     | mA       |
|          |                     | $C_L = 33pF/66MHz$              |     | 40   |     |          |
|          |                     | $C_L = 22pF/80MHz$              |     | 35   |     |          |
|          |                     | $C_L = 15pF/100MHz$             |     | 32   |     |          |
|          |                     | $C_L = 10pF/125MHz$             |     | 28   |     |          |
|          |                     | $C_L = 10pF/155MHz$             |     | 41   |     |          |
| $Z_O$    | Output Impedance    |                                 |     | 20   |     | $\Omega$ |
| L        | Pin Inductance      |                                 |     |      | 7   | nH       |

**PI6CV304 AC Characteristics** ( $T_A = -40 \sim 85^\circ C, V_{DD} = 3.3V \pm 0.3V, 33pF/66MHz$  and  $10pF/160MHz$ )

| Symbol             | Parameter                     | Conditions  | Min. | Typ. | Max. | Units |
|--------------------|-------------------------------|---|------|------|------|-------|
| $f_{IN}$           | Input frequency               |   | 0    |      | 160  | MHz   |
| $t_{PLH}$          | Low-to-high propagation delay | CLK_IN to Y[0-3] rising edges @ 1.5V  | 1.0  |      | 3.0  | ns    |
| $t_{PHL}$          | High-to-low propagation delay | CLK_IN to Y[0-3] falling edges @ 1.5V   | 1.0  |      | 3.0  |       |
| $t_{SK(O)}$        | Output skew <sup>(2)</sup>    | @ 1.5V  |      |      | 100  | ps    |
| $t_{SK(P)}$        | Pulse skew                    | @ 1.5V  |      |      | 300  |       |
| $t_{SK(T)}$        | Package skew <sup>(1)</sup>   | @ 1.5V  |      |      | 500  |       |
| $t_R, t_F$         | Rise, Fall time               | 0.8V~2.0V   |      |      | 1.2  | ns    |
| $t_{PZL}, t_{PZH}$ | Output enable time            |   |      |      | 5    |       |
| $t_{PLZ}, t_{PHZ}$ | Output disable time           |   |      |      | 10   |       |
| $t_{DC}$           | Output Duty Cycle             | $t_{DC} = t_H/t_{CY}$ , $t_H$ = High Pulse Width,<br>$t_{CY}$ = Output Cycle Time, @ 1.5V | 45   |      | 55   | %     |

**Note:**

- Identical traces, loads, power supply.
- Maximum Output Skew is 100ps when frequency is below 125MHz with 10pF loading.

**PI6CV2304 DC Characteristics Over Operating Conditions**

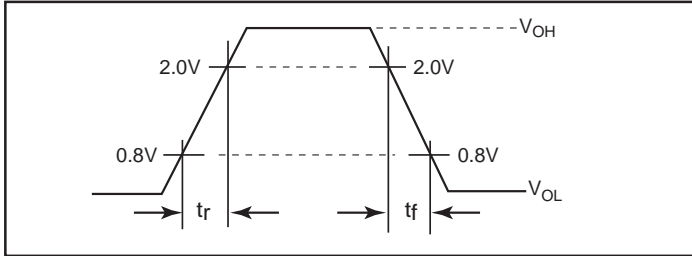
| Symbol          | Parameter           | Conditions                                     | Min. | Typ. | Max. | Units |
|-----------------|---------------------|--|------|------|------|-------|
| V <sub>IL</sub> | Low Input Voltage   |  |      |      | 0.8  | V     |
| V <sub>IH</sub> | High Input Voltage  |  | 2.0  |      |      |       |
| I <sub>IL</sub> | Low Input Current   | V <sub>IN</sub> = 0V                           |      |      | -50  | μA    |
| I <sub>IH</sub> | High Input Current  | V <sub>IN</sub> = V <sub>DD</sub>              |      |      | 200  |       |
| V <sub>OL</sub> | Low Output Voltage  | V <sub>DD</sub> = 3.0V, I <sub>OL</sub> = 8 mA |      |      | 0.4  | V     |
| V <sub>OH</sub> | High Output Voltage | V <sub>DD</sub> = 3.0V, I <sub>OH</sub> = -8mA | 2.4  |      |      |       |
| I <sub>DD</sub> | Supply Current      | C <sub>L</sub> = 33pF/33MHz                    |      | 20   |      | mA    |
|                 |                     | C <sub>L</sub> = 33pF/66MHz                    |      | 41   |      |       |
|                 |                     | C <sub>L</sub> = 22pF/80MHz                    |      | 35   |      |       |
|                 |                     | C <sub>L</sub> = 15pF/100MHz                   |      | 34   |      |       |
|                 |                     | C <sub>L</sub> = 10pF/125MHz                   |      | 31   |      |       |
| C <sub>O</sub>  | Output Capacitance  |  |      |      | 7    | pF    |
| C <sub>I</sub>  | Input Capacitance   |  |      |      | 5    |       |
| Z <sub>O</sub>  | Output Impedance    |  |      | 30   |      | Ω     |
| L               | Pin Inductance      |  |      |      | 7    | nH    |

**PI6CV2304 AC Characteristics** (T<sub>A</sub> = -40~85°C, V<sub>DD</sub> = 3.3V ±0.3V, 33pF/66MHz and 10pF/133MHz)

| Symbol                              | Parameter                     | Conditions  | Min. | Typ. | Max. | Units |
|-------------------------------------|-------------------------------|---|------|------|------|-------|
| f <sub>IN</sub>                     | Input frequency               |   | 0    |      | 140  | MHz   |
| t <sub>PLH</sub>                    | Low-to-high propagation delay | CLK_IN to Y[0-3] rising edges @ 1.5V  | 1.0  |      | 3.0  | ns    |
| t <sub>PHL</sub>                    | High-to-low propagation delay | CLK_IN to Y[0-3] falling edges @ 1.5V   | 1.0  |      | 3.0  |       |
| t <sub>SK(O)</sub>                  | Output skew                   | @ 1.5V  |      |      | 150  | ps    |
| t <sub>SK(P)</sub>                  | Pulse skew                    | @ 1.5V  |      |      | 300  |       |
| t <sub>SK(T)</sub>                  | Package skew <sup>(1)</sup>   | @ 1.5V  |      |      | 500  |       |
| t <sub>R</sub> , t <sub>F</sub>     | Rise, Fall time               | 0.8V~2.0V   |      |      | 1.35 | ns    |
| t <sub>PZL</sub> , t <sub>PZH</sub> | Output enable time            |   |      |      | 5    |       |
| t <sub>PLZ</sub> , t <sub>PHZ</sub> | Output disable time           |   |      |      | 10   |       |
| t <sub>DC</sub>                     | Output duty cycle             | t <sub>DC</sub> = t <sub>H</sub> /t <sub>CY</sub> , t <sub>H</sub> = High Pulse Width,<br>t <sub>CY</sub> = Output Cycle Time, @ 1.5V | 45   |      | 55   | %     |

**Note:** 1. Identical traces, loads, power supply.

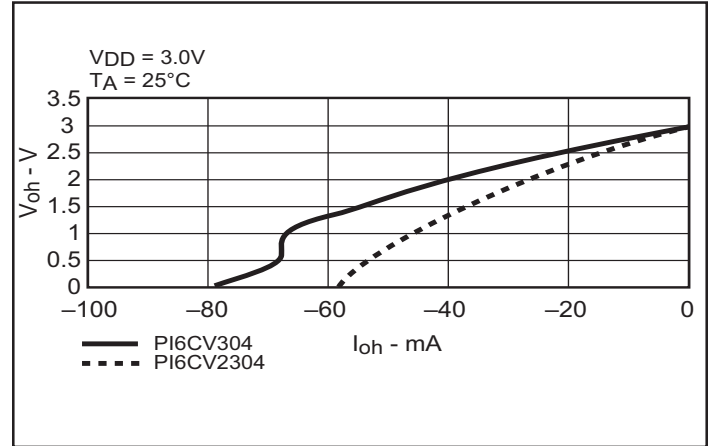
### Rise/Fall Time



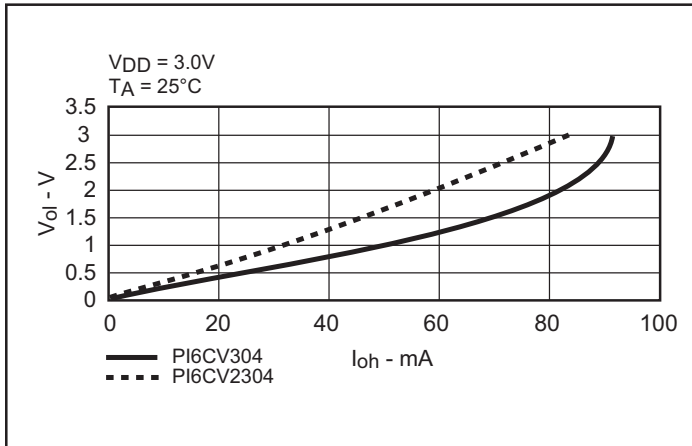
**Note:**

For test circuit:  $R_S = 0$  for PI6CV2304,  $R_S = 15$  ohms for PI6CV304  
 $C_L = 10, 15, 22,$  or  $33$ pF, depending on frequency.

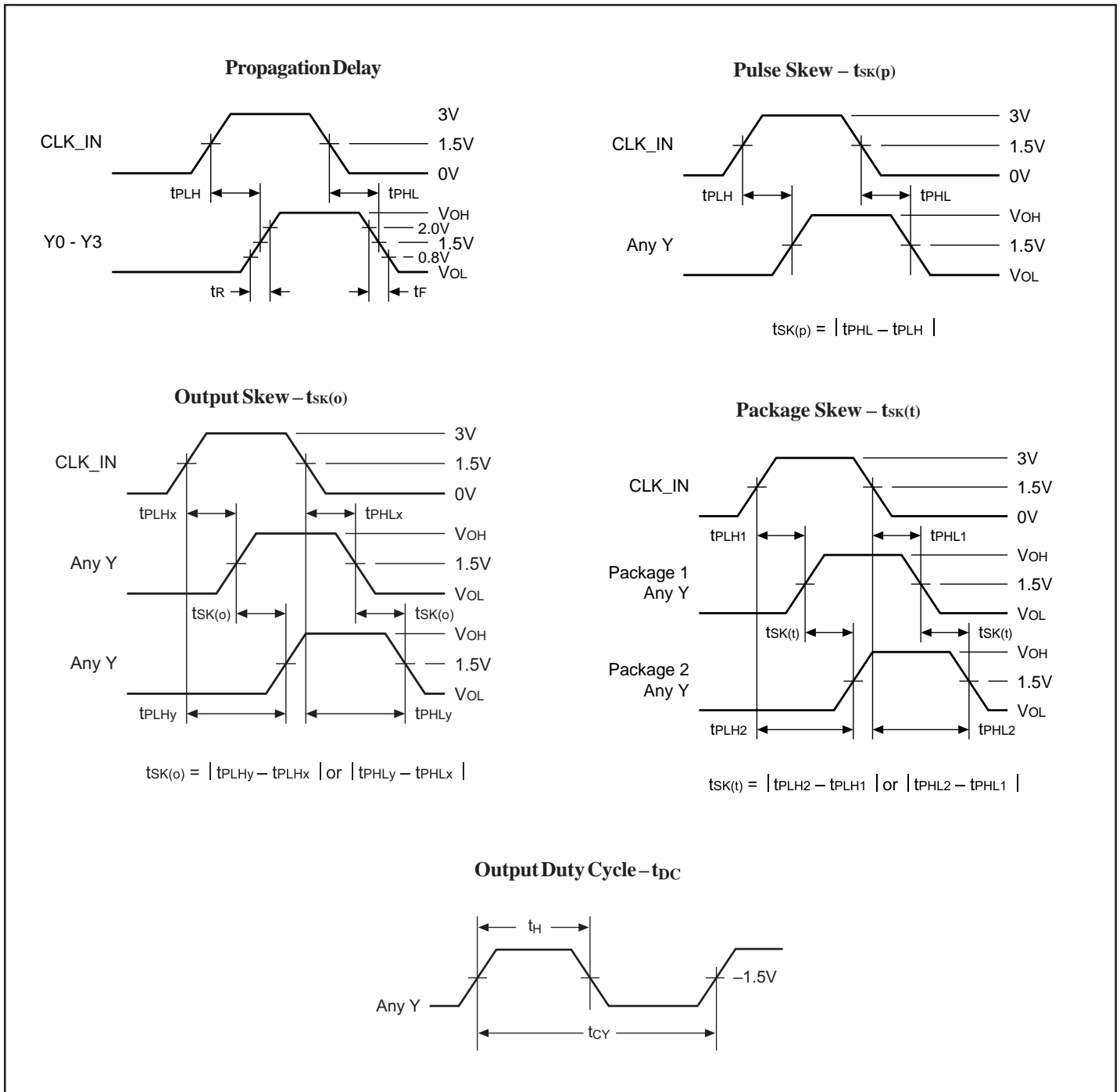
### High-Level Output Voltage vs. High-Level Output Current



### Low-Level Output Voltage vs. Low-Level Output Current



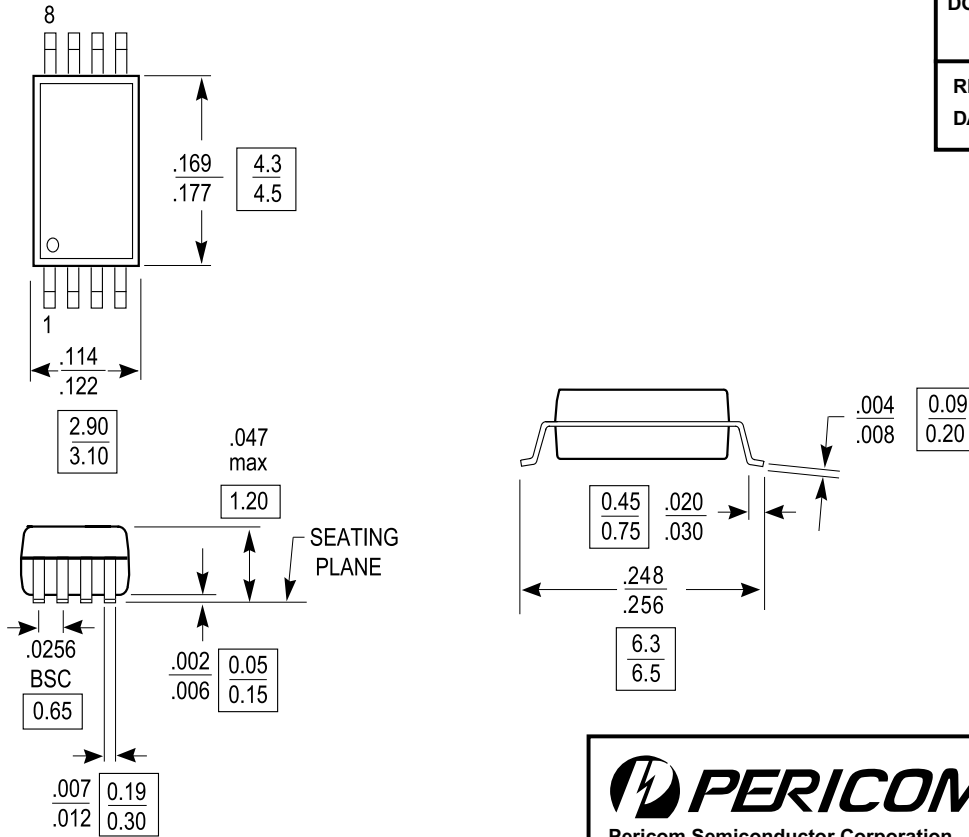
### Switching Waveforms



Packaging Mechanical: 8-Pin TSSOP (L)

DOCUMENT CONTROL NO.  
PD - 1308

REVISION: E  
DATE: 11/15/05



- Note:**
1. Package Outline Exclusive of Mold Flash and Metal Burr
  2. Controlling dimensions in millimeters
  3. Ref: JEDEC MO-153F/AA



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

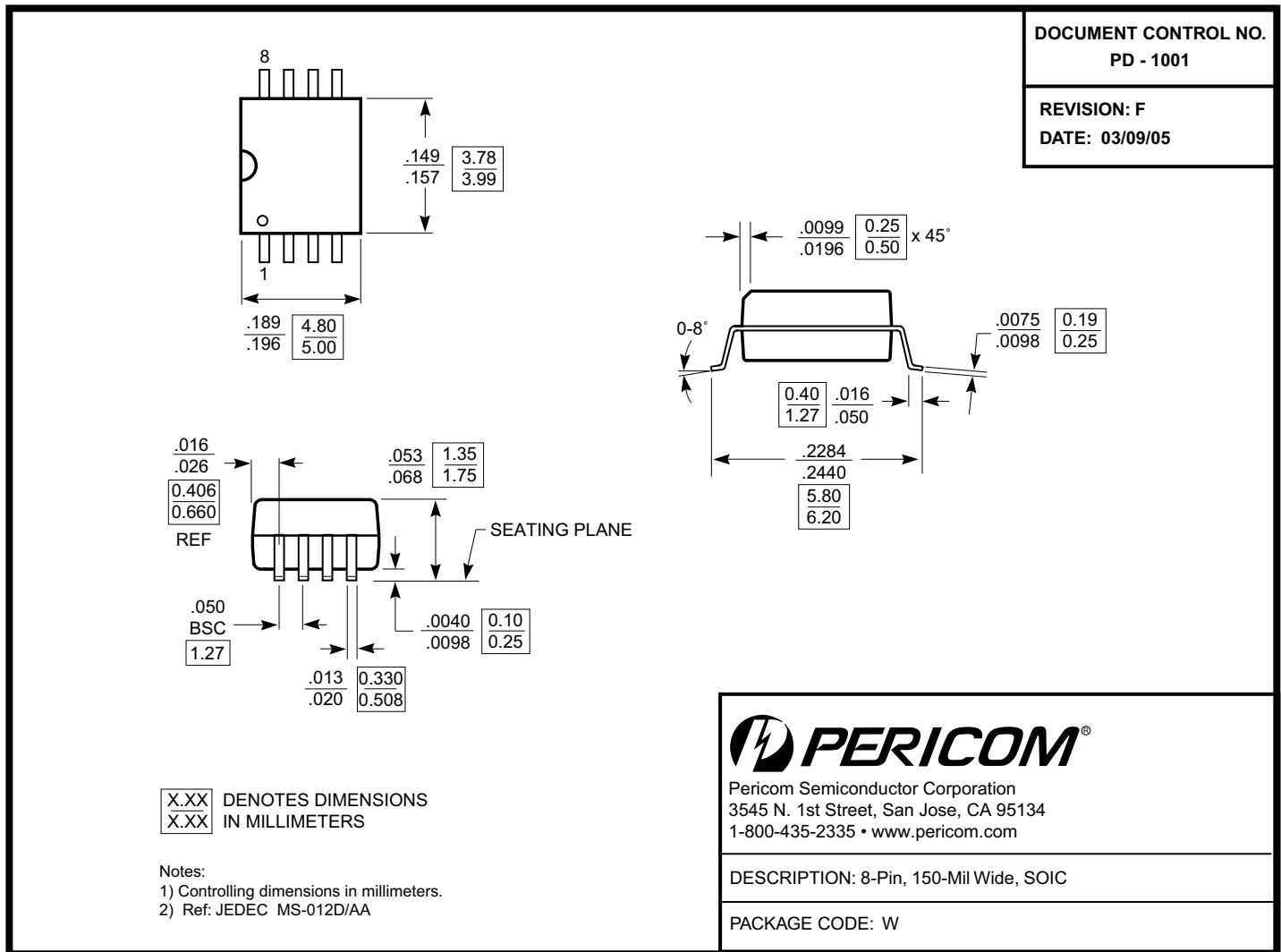
DESCRIPTION: 8-Pin, 173-Mil Wide, TSSOP

PACKAGE CODE: L

**Note:**

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

Packaging Mechanical: 8-Pin SOIC (W)



**Note:**

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

**Ordering Information**

| Ordering Code | Package Code | Package Type                              |
|---------------|--------------|---|
| PI6CV304L     | L            | 8-pin 173-mil wide TSSOP                  |
| PI6CV304LE    | L            | Pb-free & Green, 8-pin 173-mil wide TSSOP |
| PI6CV304W     | W            | 8-pin 150-mil wide SOIC                   |
| PI6CV304WE    | W            | Pb-free & Green, 8-pin 150-mil wide SOIC  |
| PI6CV2304L    | L            | 8-pin 173-mil wide TSSOP                  |
| PI6CV2304LE   | L            | Pb-free & Green, 8-pin 173-mil wide TSSOP |
| PI6CV2304WE   | W            | Pb-free & Green, 8-pin 150-mil wide SOIC  |

**Notes:**

1. Thermal characteristics can be found on the company web site at [www.pericom.com/packaging/](http://www.pericom.com/packaging/)



# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

## Diodes Incorporated:

[PI6CV304LEX](#) [PI6CV304LE](#) [PI6CV2304WEX](#) [PI6CV304WEX](#) [PI6CV304WE](#) [PI6CV2304WE](#) [PI6CV2304LE](#)  
[PI6CV2304LEX](#) [PI6CV2304LE-2017](#) [PI6CV304LE-2017](#) [PI6CV304LEX-2017](#) [PI6CV2304LEX-2017](#)



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

**Телефон:** 8 (812) 309 58 32 (многоканальный)

**Факс:** 8 (812) 320-02-42

**Электронная почта:** [org@eplast1.ru](mailto:org@eplast1.ru)

**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.