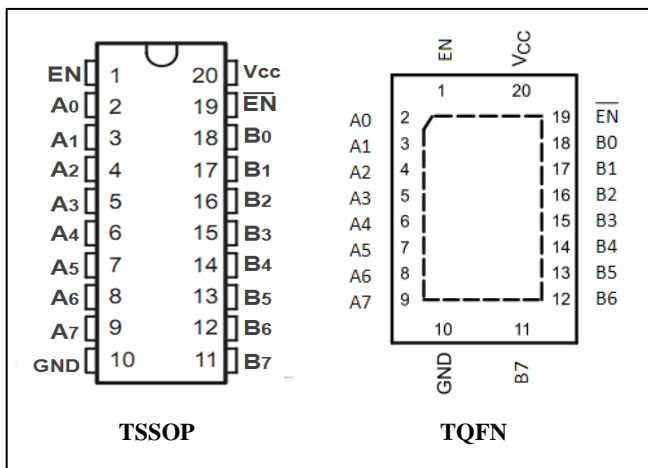


## 8-Bit Bus Switch, 2-Enable High or Low 1.8V/2.5V/3.3V, High-Bandwidth, Hot Plug

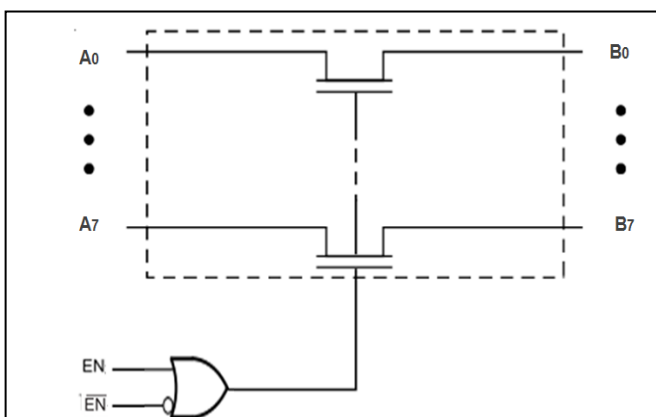
### Features

- Near-Zero propagation delay
- 5-ohm switches connect inputs to outputs
- High signal passing bandwidth (500 MHz)
- Beyond Rail-to-Rail switching
  - 0 to 5V switching with 3.3V power supply
  - 0 to 3.3V switching with 2.5V power supply
- 5V I/O tolerant with supply in OFF and ON state
- 1.8V, 2.5V and 3.3V supply voltage operation
- Hot Insertion Capable
- Industrial Operating Temperature: -40 °C to +85 °C
- 8kV ESD Protection (human body model)
- Latch-up Performance: >200mA per JESD17
- Packaging (Pb-free & Green available):
  - 20-pin 173-mil wide plastic TSSOP (L)
  - 20-pin TQFN(ZH)

### Pin Configuration



### Block Diagram



### Description

The PI3CH3345 is a Low-voltage, 8-channel switch designed with fast enables. The switch creates no additional ground bounce noise or propagation delay.

The PI3CH3345 device has two active LOW enables. It is very useful in switching signals that have high bandwidth (500 MHz).

### Applications

- High Bandwidth Data Switching
- Hot-Docking
- Analog Signal Switching
- Differential Signal Switching

### Pin Description

| Pin No | Pin Name | Description   |
|--------|----------|---------------|
| 1, 19  | EN, EN̄  | Switch Enable |
| 2-9    | A0-A7    | A Ports       |
| 11-18  | B7-B0    | B Ports       |
| 10     | GND      | Ground        |
| 20     | VCC      | Power         |

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

| B0-B7 | EN | EN̄ | Function   |
|-------|----|-----|------------|
| Hi-Z  | L  | H   | Disconnect |
| A0-A7 | H  | H   | Connect    |
| A0-A7 | L  | L   | Connect    |
| A0-A7 | H  | L   | Connect    |

#### Note:

1. H=High Voltage Level; L=Low Voltage Level  
Hi-Z= High Impedance.

## Maximum Ratings

|   |                  |
|---|------------------|
| Storage Temperature.....                    | -65°C to +150°C  |
| Ambient Temperature with Power Applied..... | -40 °C to +85 °C |
| Supply Voltage to Ground Potential.....     | -0.5V to +4.6V   |
| DC Input Voltage.....                       | -0.5V to +6.0V   |
| DC Output Current.....                      | 120mA            |
| Power Dissipation.....                      | 0.5W             |

**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.

## DC Electrical Characteristics

3.3V supply (Over operating range,  $T_A = -40 \sim +85 \text{ °C}$ ,  $V_{CC} = 3.3V \pm 10\%$ , unless otherwise noted)

| Symbol    | Description                         | Test Conditions <sup>(1)</sup>  | Min  | Type <sup>(2)</sup> | Max     | Unit          |
|-----------|-------------------------------------|---|------|---------------------|---------|---------------|
| $V_{IH}$  | Control Input HIGH Voltage          | Guaranteed Logic HIGH Level   | 2.0  | -                   | -       | V             |
| $V_{IL}$  | Control Input LOW Voltage           | Guaranteed Logic LOW Level  | -0.5 | -                   | 0.8     | V             |
| $V_{IK}$  | Clamp Diode Voltage                 | $V_{CC} = \text{Min.}, I_{IN} = -18\text{mA}$   | -    | -1.3                | -1.8    | V             |
| $I_{IH}$  | Input HIGH Current                  | $V_{CC} = \text{Max.}, V_{IN} = V_{CC}$   | -    | -                   | $\pm 1$ | $\mu\text{A}$ |
| $I_{IL}$  | Input Low Current                   | $V_{CC} = \text{Max.}, V_{IN} = \text{GND}$   | -    | -                   | $\pm 1$ | $\mu\text{A}$ |
| $I_{OZH}$ | High-Impedance Current              | $0 \leq A, B \leq V_{CC}$   | -    | -                   | $\pm 1$ | $\mu\text{A}$ |
| $R_{ON}$  | Switch On-Resistance <sup>(3)</sup> | $V_{CC} = \text{Min.}, V_{IN} = 0.0\text{V}$<br>$I_{ON} = -48\text{mA}$ or $-64\text{mA}$ | -    | 4                   | 6       | $\Omega$      |
|           |                                     | $V_{CC} = \text{Min.}, V_{IN} = 3.6\text{V}$<br>$I_{ON} = -15\text{mA}$                   | -    | 5                   | 8       |               |

**Notes:**

- For Max. or Min. conditions, use appropriate value specified under Electrical Characteristics for the applicable device type.
- Typical values are at  $V_{CC} = 3.3\text{V}$ ,  $T_A = 25 \text{ °C}$  ambient and maximum loading.
- Measured by the voltage drop between A and B pin at indicated current through the switch. ON resistance is determined by the lower of the voltages on the two (A, B) pins.

2.5V supply (Over operating range,  $T_A = -40 \sim +85 \text{ °C}$ ,  $V_{CC} = 2.5V \pm 10\%$ , unless otherwise noted)

| Symbol    | Description                         | Test Conditions <sup>(1)</sup>   | Min  | Type <sup>(2)</sup> | Max            | Unit          |
|-----------|-------------------------------------|--|------|---------------------|----------------|---------------|
| $V_{IH}$  | Control Input HIGH Voltage          | Guaranteed Logic HIGH Level  | 1.8  | -                   | $V_{CC} + 0.3$ | V             |
| $V_{IL}$  | Control Input LOW Voltage           | Guaranteed Logic LOW Level   | -0.3 | -                   | 0.8            | V             |
| $V_{IK}$  | Clamp Diode Voltage                 | $V_{CC} = \text{Max.}, I_{IN} = -6\text{mA}$                             | -    | -0.7                | -1.8           | V             |
| $I_{IH}$  | Input HIGH Current                  | $V_{CC} = \text{Max.}, V_{IN} = V_{CC}$                                  | -    | -                   | $\pm 1$        | $\mu\text{A}$ |
| $I_{IL}$  | Input Low Current                   | $V_{CC} = \text{Max.}, V_{IN} = \text{GND}$                              | -    | -                   | $\pm 1$        | $\mu\text{A}$ |
| $I_{OZH}$ | High-Impedance Current              | $0 \leq A, B \leq V_{CC}$  | -    | -                   | $\pm 1$        | $\mu\text{A}$ |
| $R_{ON}$  | Switch On-Resistance <sup>(3)</sup> | $V_{CC} = \text{Min.}, V_{IN} = 0.0\text{V}$<br>$I_{ON} = -48\text{mA}$  | -    | 4                   | 8              | $\Omega$      |
|           |                                     | $V_{CC} = \text{Min.}, V_{IN} = 2.25\text{V}$<br>$I_{ON} = -15\text{mA}$ | -    | 7                   | 14             |               |

**Notes:**

- For Max. or Min. conditions, use appropriate value specified under Electrical Characteristics for the applicable device type.
- Typical values are at  $V_{CC} = 2.5\text{V}$ ,  $T_A = 25 \text{ °C}$  ambient and maximum loading.
- Measured by the voltage drop between A and B pin at indicated current through the switch. ON resistance is determined by the lower of the voltages on the two (A, B) pins.

1.8V supply (Over operating range,  $T_A = -40 \sim +85 \text{ }^\circ\text{C}$ ,  $V_{CC}=1.8\text{V} \pm 10\%$ , unless otherwise noted)

| Symbol    | Description                         | Test Conditions <sup>(1)</sup>  | Min  | Type <sup>(2)</sup> | Max          | Unit          |
|-----------|-------------------------------------|---|------|---------------------|--------------|---------------|
| $V_{IH}$  | Control Input HIGH Voltage          | Guaranteed Logic HIGH Level   | 1.2  | -                   | $V_{CC}+0.3$ | V             |
| $V_{IL}$  | Control Input LOW Voltage           | Guaranteed Logic LOW Level  | -0.3 | -                   | 0.8          | V             |
| $V_{IK}$  | Clamp Diode Voltage                 | $V_{CC} = \text{Min.}, I_{IN} = -18\text{mA}$                           | -    | -0.7                | -1.8         | V             |
| $I_{IH}$  | Input HIGH Current                  | $V_{CC} = \text{Max.}, V_{IN} = V_{CC}$                                 | -    | -                   | $\pm 1$      | $\mu\text{A}$ |
| $I_{IL}$  | Input Low Current                   | $V_{CC} = \text{Max.}, V_{IN} = \text{GND}$                             | -    | -                   | $\pm 1$      | $\mu\text{A}$ |
| $I_{OZH}$ | High-Impedance Current              | $0 \leq A, B \leq V_{CC}$   | -    | -                   | $\pm 1$      | $\mu\text{A}$ |
| $R_{ON}$  | Switch On-Resistance <sup>(3)</sup> | $V_{CC} = \text{Min.}, V_{IN} = 0.0\text{V}$<br>$I_{ON} = -48\text{mA}$ | -    | 4                   | 8            | $\Omega$      |
|           |                                     | $V_{CC} = \text{Min.}, V_{IN} = 1.6\text{V}$<br>$I_{ON} = -15\text{mA}$ | -    | 10                  | 25           |               |

**Notes:**

- For Max. or Min. conditions, use appropriate value specified under Electrical Characteristics for the applicable device type.
- Typical values are at  $V_{CC} = 1.8\text{V}$ ,  $T_A = 25 \text{ }^\circ\text{C}$  ambient and maximum loading.
- Measured by the voltage drop between A and B pin at indicated current through the switch. ON resistance is determined by the lower of the voltages on the two (A, B) pins.

**Capacitance** ( $T_A = 25 \text{ }^\circ\text{C}$ ,  $f=1\text{MHz}$ )

| Symbol <sup>(1)</sup> | Description                 | Test Conditions      | Type <sup>(2)</sup> | Unit          |
|-----------------------|-----------------------------|----------------------|---------------------|---------------|
| $C_{IN}$              | Input Capacitance           | $V_{IN} = 0\text{V}$ | 2.0                 | $\mu\text{F}$ |
| $C_{OFF}$             | A/B Capacitance, Switch Off |                      | 3.5                 |               |
| $C_{ON}$              | A/B Capacitance, Switch On  |                      | 7.0                 |               |

**Note:**

- These parameters are determined by device characterization but are not production tested

**Power Supply Characteristics**

| Symbol   | Description                    | Test Conditions <sup>(1)</sup>                         | Min | Type <sup>(2)</sup> | Max | Unit |
|----------|--------------------------------|--|-----|---------------------|-----|------|
| $I_{CC}$ | Quiescent Power Supply Current | $V_{CC} = 3.6\text{V}, V_{IN} = \text{GND or } V_{CC}$ | -   | 0.2                 | 0.5 | mA   |

**Note:**

- For Max. or Min. conditions, use appropriate value specified under Electrical Characteristics for the applicable device.
- Typical values are at  $+25 \text{ }^\circ\text{C}$  ambient.

**Dynamic Electrical Characteristics**

(Over Operating Range,  $T_A = -40 \sim +85 \text{ }^\circ\text{C}$ ,  $V_{CC}=3.3\text{V} \pm 10\%$ )

| Symbol     | Description    | Test Conditions  | Min | Type | Max | Unit        |
|------------|----------------|------------------|-----|------|-----|-------------|
| $X_{TALK}$ | Crosstalk      | 10MHz            | -   | -60  | -   | $\text{dB}$ |
| $O_{IRR}$  | Off-Isolation  | 10MHz            | -   | -60  | -   |             |
| BW         | -3dB Bandwidth | See test Diagram | -   | 500  | -   | MHz         |

**Switch Characteristics**

Over 3.3V Operating Range

| Symbol             | Description  | Test Conditions <sup>(1)</sup> | Min | Type | Max | Unit        |
|--------------------|--|--------------------------------|-----|------|-----|-------------|
| $t_{PLH}, t_{PHL}$ | Propagation Delay <sup>(2, 3)</sup> A to B, B to A | See test Diagram               | -   | -    | 0.3 | $\text{ns}$ |
| $t_{PZH}, t_{PZL}$ | Enable Time $\overline{\text{EN}}$ , EN to A or B  | See test Diagram               | 1.5 | -    | 9.0 |             |
| $t_{PHZ}, t_{PLZ}$ | Disable Time $\overline{\text{EN}}$ , EN to A or B | See test Diagram               | 1.5 | -    | 9.0 |             |

**Note:**

1. See test circuit and waveforms.
2. This parameter is guaranteed but not tested on Propagation Delays.
3. The switch contributes no propagation delay other than the RC delay of the On-Resistance of the switch and the load capacitance. The time constant for the switch alone is of the order of 0.30ns for 10pF load. Since this time constant is much smaller than the rise/fall times of typical driving signals, it adds very little propagation delay to the system. Propagation delay of the switch when used in a system is determined by the driving circuit on the driving side of the switch and its interaction with the load on the driven side.

**Over 2.5V Operating Range**

| Symbol             | Description  | Test Conditions <sup>(1)</sup> | Min | Type | Max  | Unit |
|--------------------|--|--------------------------------|-----|------|------|------|
| $t_{PLH}, t_{PHL}$ | Propagation Delay <sup>(2, 3)</sup> A to B, B to A | See test Diagram               | -   | -    | 0.3  | ns   |
| $t_{PZH}, t_{PZL}$ | Enable Time $\overline{EN}$ , EN to A or B         | See test Diagram               | 1.5 | -    | 15.0 |      |
| $t_{PHZ}, t_{PLZ}$ | Disable Time $\overline{EN}$ , EN to A or B        | See test Diagram               | 1.5 | -    | 12.0 |      |

**Note:**

1. See test circuit and waveforms.
2. This parameter is guaranteed but not tested on Propagation Delays.
3. The switch contributes no propagation delay other than the RC delay of the On-Resistance of the switch and the load capacitance. The time constant for the switch alone is of the order of 0.30ns for 10pF load. Since this time constant is much smaller than the rise/fall times of typical driving signals, it adds very little propagation delay to the system. Propagation delay of the switch when used in a system is determined by the driving circuit on the driving side of the switch and its interaction with the load on the driven side.

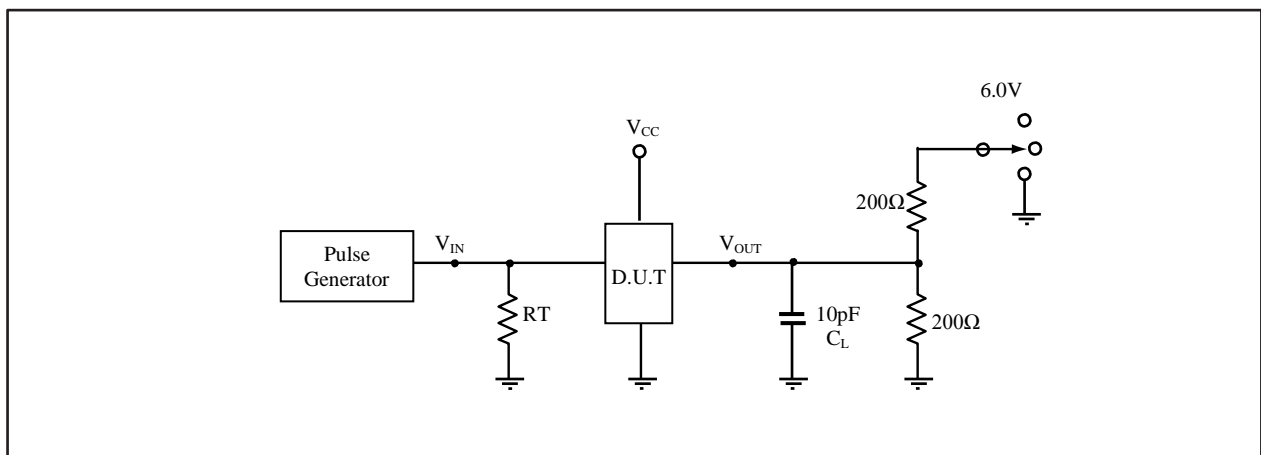
**Over 1.8V Operating Range**

| Symbol             | Description  | Test Conditions <sup>(1)</sup> | Min | Type | Max  | Unit |
|--------------------|--|--------------------------------|-----|------|------|------|
| $t_{PLH}, t_{PHL}$ | Propagation Delay <sup>(2, 3)</sup> A to B, B to A | See test Diagram               | -   | -    | 0.3  | ns   |
| $t_{PZH}, t_{PZL}$ | Enable Time $\overline{EN}$ , EN to A or B         | See test Diagram               | 1.5 | -    | 25.0 |      |
| $t_{PHZ}, t_{PLZ}$ | Disable Time $\overline{EN}$ , EN to A or B        | See test Diagram               | 1.5 | -    | 12.0 |      |

**Note:**

1. See test circuit and waveforms.
2. This parameter is guaranteed but not tested on Propagation Delays.
3. The switch contributes no propagation delay other than the RC delay of the On-Resistance of the switch and the load capacitance. The time constant for the switch alone is of the order of 0.30ns for 10pF load. Since this time constant is much smaller than the rise/fall times of typical driving signals, it adds very little propagation delay to the system. Propagation delay of the switch when used in a system is determined by the driving circuit on the driving side of the switch and its interaction with the load on the driven side.

**Test Circuit for Electrical Characteristics**



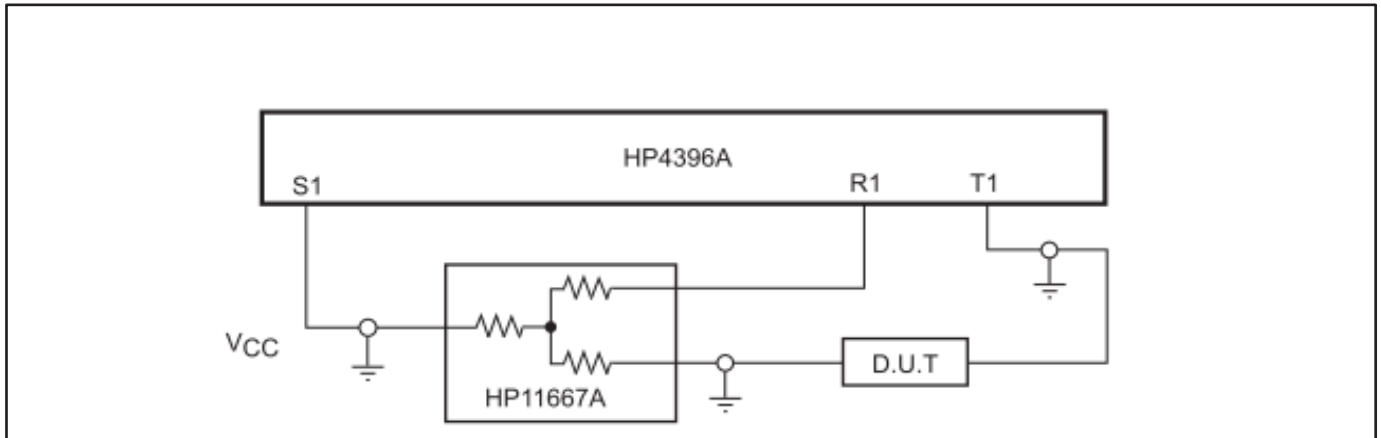
**Notes:**

1.  $C_L$  = Load capacitance: includes jig and probe capacitance.
2.  $R_T$  = Termination resistance: should be equal to  $Z_{OUT}$  of the Pulse Generator
3. All input impulses are supplied by generators having the following characteristics:  $PRR \leq 10$  MHz,  $Z_O = 50$ -ohm,  $t_R \leq 2.5$ ns,  $t_F \leq 2.5$ ns.
4. The outputs are measured one at a time with one transition per measurement.

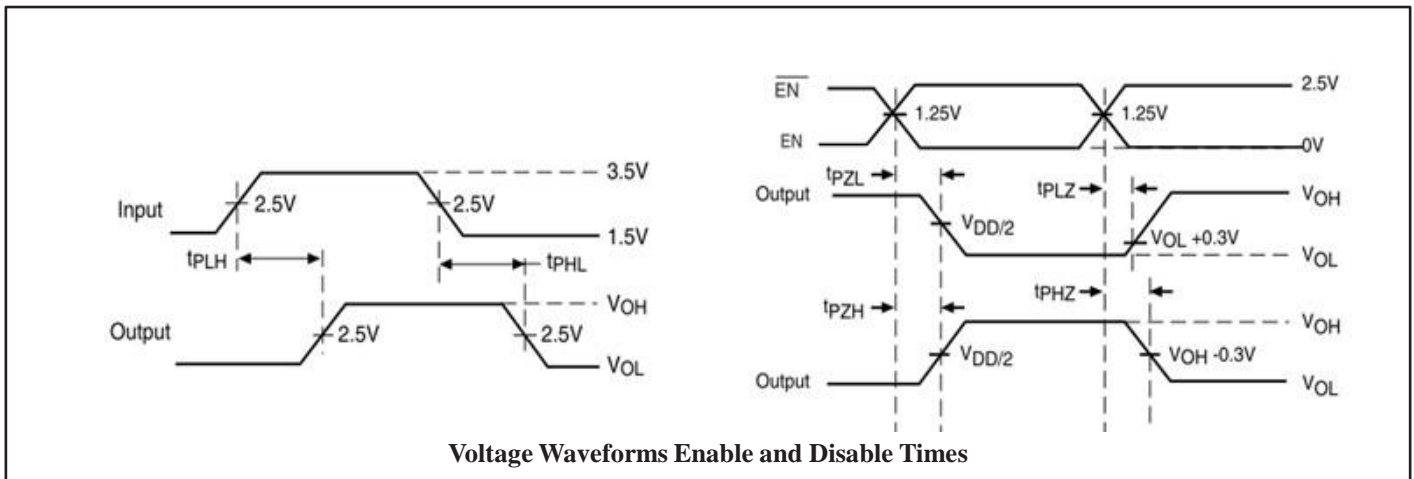
**Switch Positions**

| Test               | Switch |
|--------------------|--------|
| $t_{PLZ}, t_{PZL}$ | 6.0V   |
| $t_{PHZ}, t_{PZH}$ | GND    |
| Prop Delay         | Open   |

**Test Circuit for Dynamic Electrical Characteristics**



**Switching Waveforms**



**Applications Information**

**Logic Inputs**

The logic control inputs can be driven up to 3.6V regardless of the supply voltage. For example, given a +3.3V supply,  $\overline{EN}$  may be driven LOW to 0V and HIGH to 3.6V. Driving  $\overline{EN}$  Rail-to-Rail<sup>®</sup> minimizes power consumption.

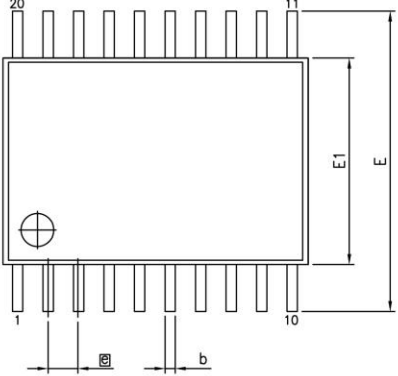
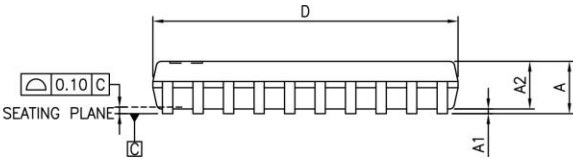
**Hot Insertion**

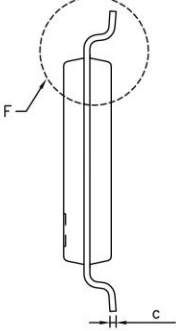
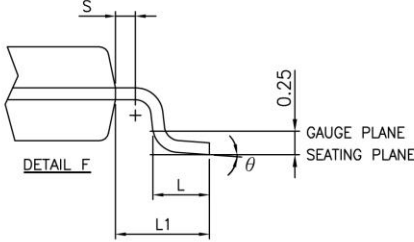
For Datacom and Telecom applications that have ten or more volts passing through the backplane, a high voltage from the power supply may be seen at the device input pins during hot insertion. The PI3CH3345 devices have maximum limits of 6V and 120mA for 20ns. If the power is higher or applied for a longer time or repeatedly reaches the maximum limits, the devices can be damaged.

*Rail-to-Rail is a registered trademark of Nippon Motorola, Ltd.*

## Mechanical Information

### 20-Pin TSSOP(L)





VARIATIONS (ALL DIMENSIONS SHOWN IN MM)

| SYMBOLS | MIN.     | NOM. | MAX. |
|---------|----------|------|------|
| A       | –        | –    | 1.20 |
| A1      | 0.05     | –    | 0.15 |
| A2      | 0.80     | –    | 1.05 |
| b       | 0.19     | –    | 0.30 |
| C       | 0.09     | –    | 0.20 |
| D       | 6.40     | 6.50 | 6.60 |
| E1      | 4.30     | 4.40 | 4.50 |
| E       | 6.40 BSC |      |      |
| e       | 0.65 BSC |      |      |
| L1      | 1.00 REF |      |      |
| L       | 0.45     | 0.60 | 0.75 |
| S       | 0.20     | –    | –    |
| θ       | 0°       | –    | 8°   |

**Notes:**

1. Refer JEDEC MO-153F/AC
2. Controlling dimensions in millimeters
3. Package outline exclusive of mold flash and metal burr



**DESCRIPTION:** 20-pin, 173mil Wide TSSOP

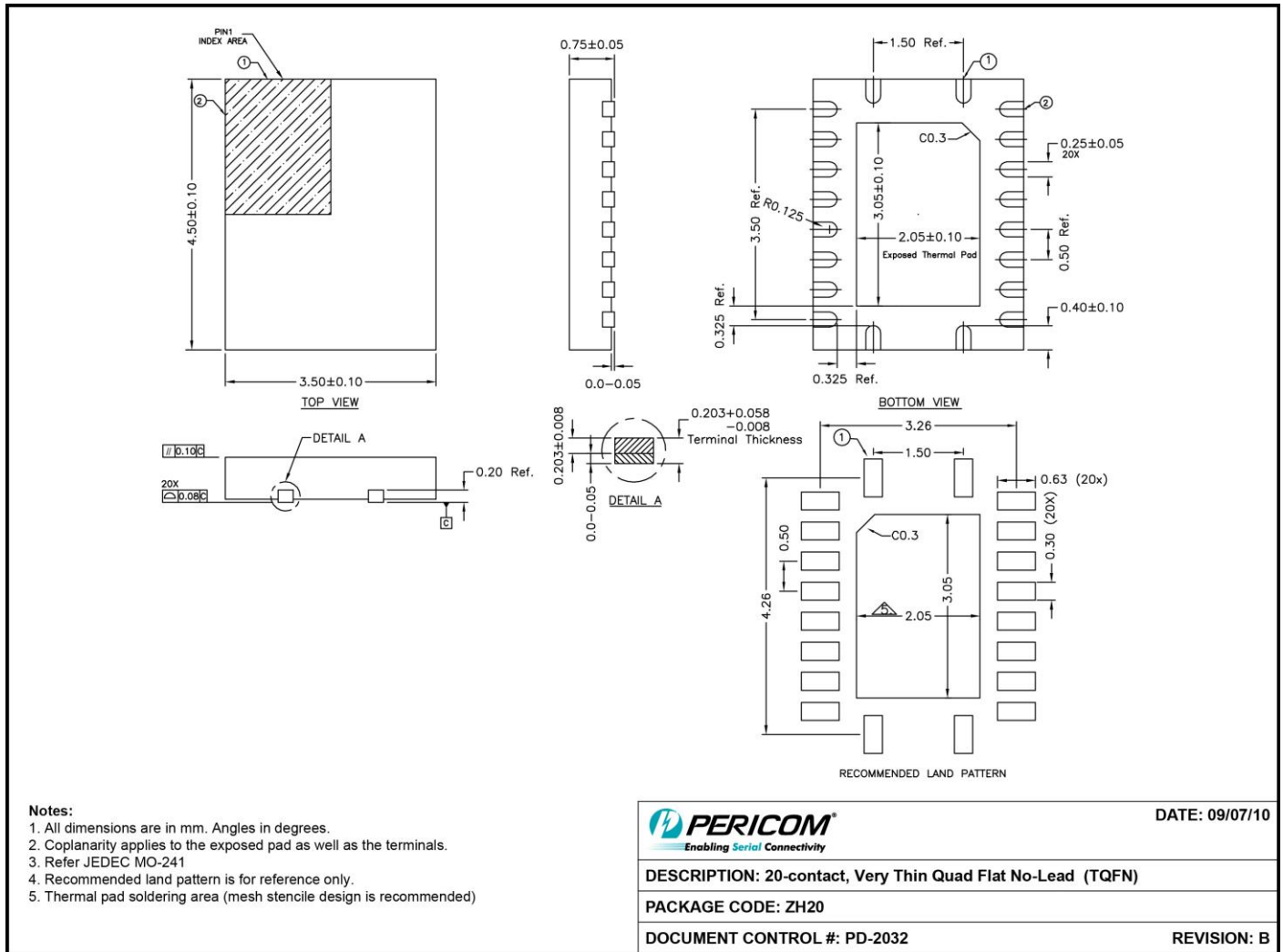
**PACKAGE CODE:** L

**DOCUMENT CONTROL #:** PD-1311

DATE: 05/03/12

REVISION: F

**20-Pin TQFN(ZH)**



**Ordering Information**

| Part No.      | Package Code | Package   |
|---------------|--------------|---|
| PI3CH3345LEX  | L            | Lead free and Green 20-Pin TSSOP ,<br>Tape & Reel |
| PI3CH3345ZHEX | ZH           | Lead free and Green 20-Pin TQFN ,<br>Tape & Reel  |

**Note:**

- E = Pb-free & Green
- Adding X Suffix= Tape/Reel

Pericom Semiconductor Corporation • 1-800-435-2336 • [www.pericom.com](http://www.pericom.com)

Pericom reserves the right to make changes to its products or specifications at any time, without notice, in order to improve design or performance and to supply the best possible product. Pericom does not assume any responsibility for use of any circuitry described other than the circuitry embodied in Pericom product. The company makes no representations that circuitry described herein is free from patent infringement or other rights, of Pericom.

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

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Компания «Океан Электроники» является официальным дистрибьютором и эксклюзивным представителем в России одного из крупнейших производителей разъемов военного и аэрокосмического назначения «JONHON», а так же официальным дистрибьютором и эксклюзивным представителем в России производителя высокотехнологичных и надежных решений для передачи СВЧ сигналов «FORSTAR».



## JONHON

«JONHON» (основан в 1970 г.)

Разъемы специального, военного и аэрокосмического назначения:

(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

«FORSTAR» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели, кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).



Телефон: 8 (812) 309-75-97 (многоканальный)

Факс: 8 (812) 320-03-32

Электронная почта: [ocean@oceanchips.ru](mailto:ocean@oceanchips.ru)

Web: <http://oceanchips.ru/>

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А