

Features

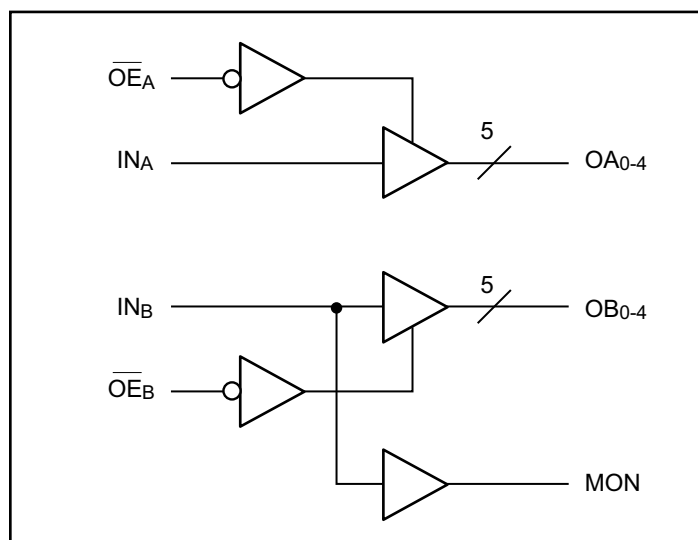
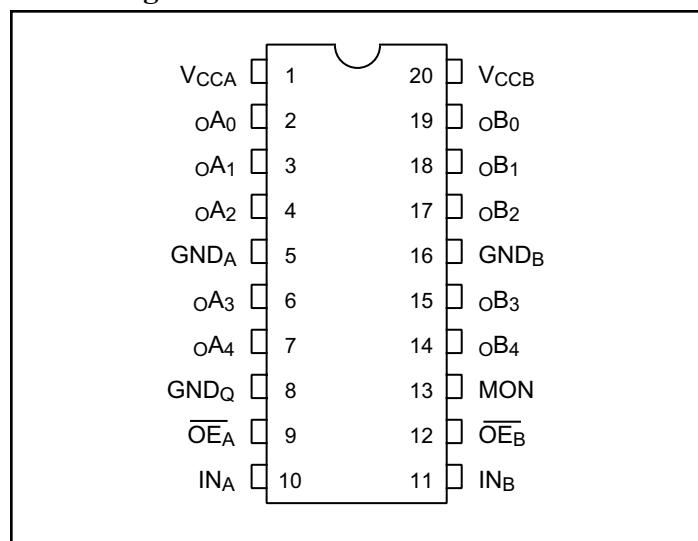
- Low output skew: <270ps
- Switching frequency of 133 MHz
- Fast output rise/fall time <1.5ns
- Low propagation delay <3.0ns
- Low input capacitance <6.0pF
- Balanced CMOS outputs
- Industrial Temperature: -40°C to +85°C
- 3.3V ±10% operation
- Packaging: (Pb-free & Green Available)
 - 20-pin 300-mil wide QSOP (Q)
 - 20-pin 150-mil wide SSOP (H)

Description

Pericom Semiconductor's PI49FCT32805 is a fast speed, low skew, fast slew rate, and low propagation delay for most computing and communication applications.

The devices are non-inverting drivers. The outputs are configured into 2 groups of 1-in, 5-out with independent output enable. Group B has an extra MON output. Excellent output signals to power and ground ratio minimize power and ground noise, and also improves output performance.

PI49FCT32805 integrate series damping resistors on all outputs.

Block Diagram

Pin Configuration

Pin Description

| Pin Name | Description |
|------------------------------------|--|
| $\overline{OE}_A, \overline{OE}_B$ | Hi-Z State Output Enable Inputs (Active LOW) |
| IN_A, IN_B | Clock Inputs |
| oA_N, oB_N | Clock Outputs |
| MON | Monitor Output |
| GND | Ground |
| V _{CC} | Power |

Truth Table⁽¹⁾

| Inputs | | Outputs | |
|------------------------------------|--------------|--------------|-----|
| $\overline{OE}_A, \overline{OE}_B$ | IN_A, IN_B | oA_N, oB_N | MON |
| L | L | L | L |
| L | H | H | H |
| H | L | Z | L |
| H | H | Z | H |

Note:

1. H = High Voltage Level, L = Low Voltage Level
Z = High Impedance

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

| Parameters ⁽¹⁾ | Description | Test Conditions | Typ | Max. | Units |
|---------------------------|--------------------|-----------------------|-----|------|-------|
| C_{IN} | Input Capacitance | $V_{IN} = 0\text{V}$ | | 4 | pF |
| C_{OUT} | Output Capacitance | $V_{OUT} = 0\text{V}$ | | 6 | |

Note:

- This parameter is determined by device characterization.

Maximum Ratings

| | |
|--|---|
| Storage Temperature | -65°C to $+150^\circ\text{C}$ |
| Ambient Temperature with Power Applied | -40°C to $+85^\circ\text{C}$ |
| Supply Voltage to Ground Potential (Inputs & V_{CC} Only)... | -0.5V to $+4.6\text{V}$ |
| Supply Voltage to Ground Potential (Outputs & I/O Only)... | -0.5V to $+4.6\text{V}$ |
| DC Input Voltage | -0.5V to $+4.6\text{V}$ |
| DC Output Current..... | 120 mA |
| 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 ($T_A = -40^\circ\text{C}$ to $+85^\circ\text{C}$, $V_{CC} = 3.3\text{V} \pm 10\%$)

| Symbol | Parameter | Test Condition ⁽¹⁾ | Min. | Typ. | Max. | Units |
|-----------|---|--|--------------------|------|------------------------------|---------------|
| V_{OH} | Output High Voltage $V_{CC} = 3.0\text{V}$, $V_{IN} = V_{IL}$ or V_{IH} | $I_{OH} = -8\text{mA}$ | 2.4 ⁽²⁾ | 3.0 | | V |
| V_{OL} | Output Low Voltage $V_{CC} = 3.0\text{V}$, $V_{IN} = V_{IL}$ or V_{IH} | $I_{OL} = +12\text{mA}$ | | 0.4 | 0.5 | |
| V_{IH} | Input High Voltage | | 2.0 | | $V_{CC} - 0.2$ | |
| V_{IL} | Input Low Voltage | | -0.5 | | 0.8 | |
| I_{IH} | Input High Current | $V_{CC} = \text{Max.}$, $V_{IN} = V_{CC}$ | | | 1 | μA |
| I_{IL} | Input Low Current | $V_{CC} = \text{Max.}$, $V_{IN} = \text{GND}$ | | | -1 | |
| I_{OZH} | High Impedance Output Current | $V_{CC} = \text{Max.}$, All outputs Disabled | | | $V_{OUT} = V_{CC}$ 1 | |
| I_{OZL} | High Impedance Output Current | $V_{CC} = \text{Max.}$, All outputs Disabled | | | $V_{OUT} = \text{GND}$ -1 | |
| V_{IK} | Clamp Diode Voltage | $V_{CC} = \text{Min.}$, $I_{IN} = -18\text{mA}$ | | -0.9 | -1.2 | V |
| I_{OH} | Output HIGH Current ⁽³⁾ | $V_{OUT} = 1.5\text{V}$, $V_{IN} = V_{IL}$ or V_{IH} , $V_{CC} = 3.3\text{V}$ | -25 | -55 | -80 | mA |
| I_{OL} | Output LOW Current ⁽³⁾ | $V_{OUT} = 1.5\text{V}$, $V_{IN} = V_{IL}$ or V_{IH} , $V_{CC} = 3.3\text{V}$ | 25 | 45 | 90 | |
| I_{OS} | Short Circuit Current ⁽⁴⁾ | $V_{CC} = \text{Max.}$, $V_{OUT} = \text{GND}$ | -50 | -100 | -180 | |
| R_S | Internal Series Resistor | | | 20 | | Ω |

Notes:

- For Max or Min conditions, use appropriate value specified under Electrical Characteristics for the applicable device type.
- $V_{OH} = V_{CC} - 0.6\text{V}$ at rated current.
- This parameter is guaranteed by device characterization.
- Not more than one output should be shorted at one time. Duration of the test should not exceed one second.

Power Supply Characteristics

| Parameters | Description | Test Conditions ⁽¹⁾ | Condition | Min. | Typ | Max. | Units |
|------------------|--|---|---|------|--------------------------------|---------------------|------------|
| I _{CC} | Quiescent Power Supply Current | V _{CC} = Max | V _{IN} = GND or V _{CC} | | 0.1 | 30 | μA |
| ΔI _{CC} | Supply Current per Inputs @ TTL HIGH | V _{CC} = Max | V _{IN} = V _{CC} - 0.6V ⁽²⁾ | | 110 | 300 | |
| I _{CCD} | Supply Current per Output per MHz ⁽³⁾ | V _{CC} = Max, Outputs Open O _{EA} or O _{EB} = GND 50% Duty Cycle | V _{IN} = V _{CC} V _{IN} = GND | | 0.09 Per Output Toggling | 0.16 | mA/ MHz |
| I _C | | V _{CC} = Max, Outputs Open f _O = 10 MHz 50% Duty Cycle O _{EA} or O _{EB} = GND Mon. Outputs Toggling | V _{IN} = V _{CC} V _{IN} = GND | | 1.3 | 9.0 ⁽⁴⁾ | mA |
| | | | V _{IN} = V _{CC} - 0.6V V _{IN} = GND | | 1.3 | 10.0 ⁽⁴⁾ | |
| | | V _{CC} = Max, Outputs Open f _O = 2.5 MHz 50% Duty Cycle O _{EA} or O _{EB} = GND Eleven Outputs Toggling | V _{IN} = V _{CC} V _{IN} = GND | | 4.4 | 6.0 ⁽⁴⁾ | |
| | | | V _{IN} = V _{CC} - 0.6V V _{IN} = GND | | 4.4 | 7.0 ⁽⁴⁾ | |

Notes:

1. For Max or Min conditions, use appropriate value specified under Electrical Characteristics for the applicable device.
2. Per TTL driven input (V_{IN} = V_{CC} - 0.6V); all other inputs at V_{CC} or GND.
3. This parameter is not directly testable, but is derived for use in Total Power Supply Calculations.
4. Values for these conditions are examples of the I_C formula. These limits are guaranteed but not tested.

Switching Characteristics

| Symbol | Description | Condition | Max. | Units |
|--|--|----------------------------|------|-------|
| t _{PLH} t _{PHL} | Propagation Delay A to B _N ⁽¹⁾ | 15pF | 3.0 | ns |
| t _R /t _F | Rise/Fall Time ⁽²⁾ 0.5V - 2.0V | 15pF | 1.5 | |
| t _{SK(P)} | Pulse Skew ⁽²⁾ | Same Output | 0.35 | |
| t _{SK(O)} | Output Skew ⁽²⁾ | Same Package, Same Bank | 0.27 | |
| t _{SK(I)} | Package Skew ⁽²⁾ | Same Package, Same Bank | 0.55 | |
| t _{ZL} , t _{ZH} t _{LZ} , t _{HZ} | Enable/Disable Time | 15pF 500Ω | 5.2 | |
| F _{MAX} | Input Frequency | 15pF | 133 | MHz |

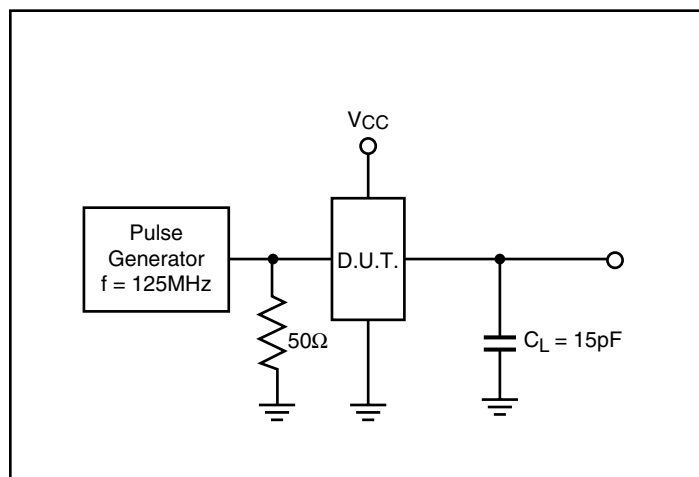
Notes:

1. Minimum propagation delay of 1.5ns is guaranteed but not tested.
2. These parameters are guaranteed by design

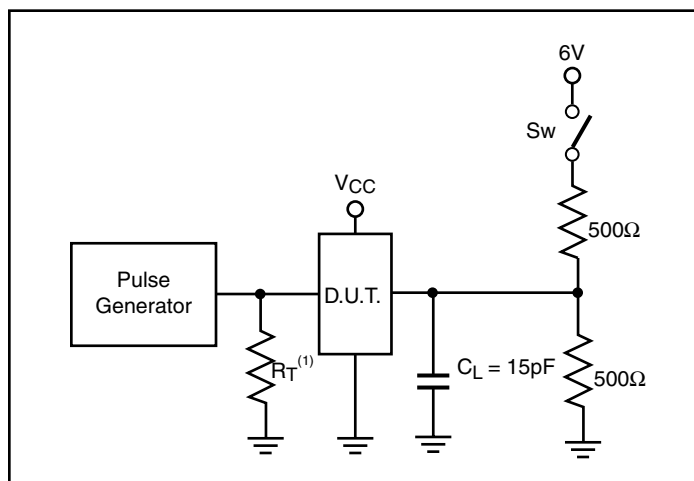
Switch Position

| Test | Switch |
|-----------------------------|--------|
| Disable Low Enable Low | 6V |
| Disable High Enable High | GND |
| All Other Inputs | Open |

Tests Circuits for F_{IN} >100 MHz



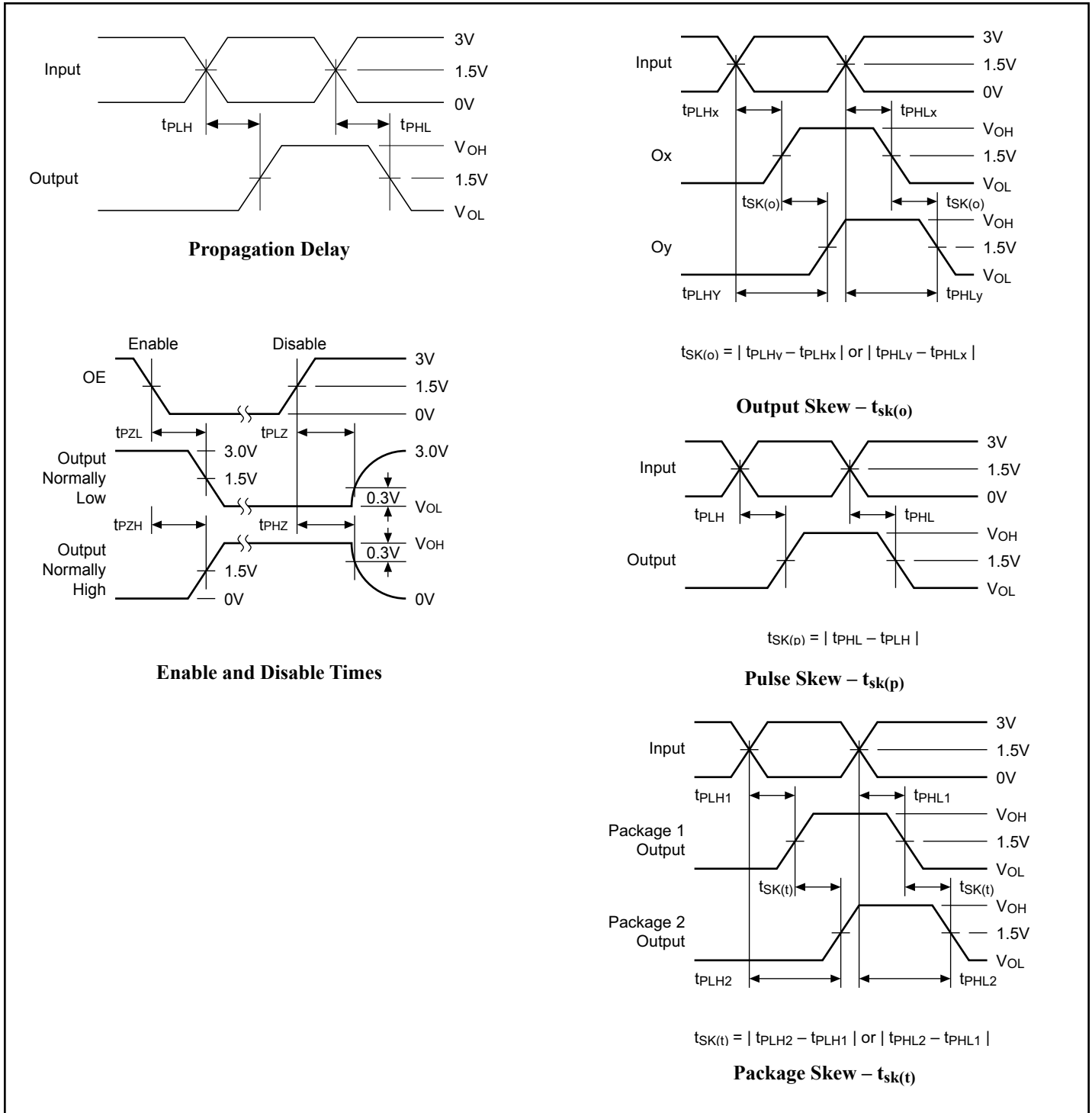
Enable/Disable Time Test Set-Up

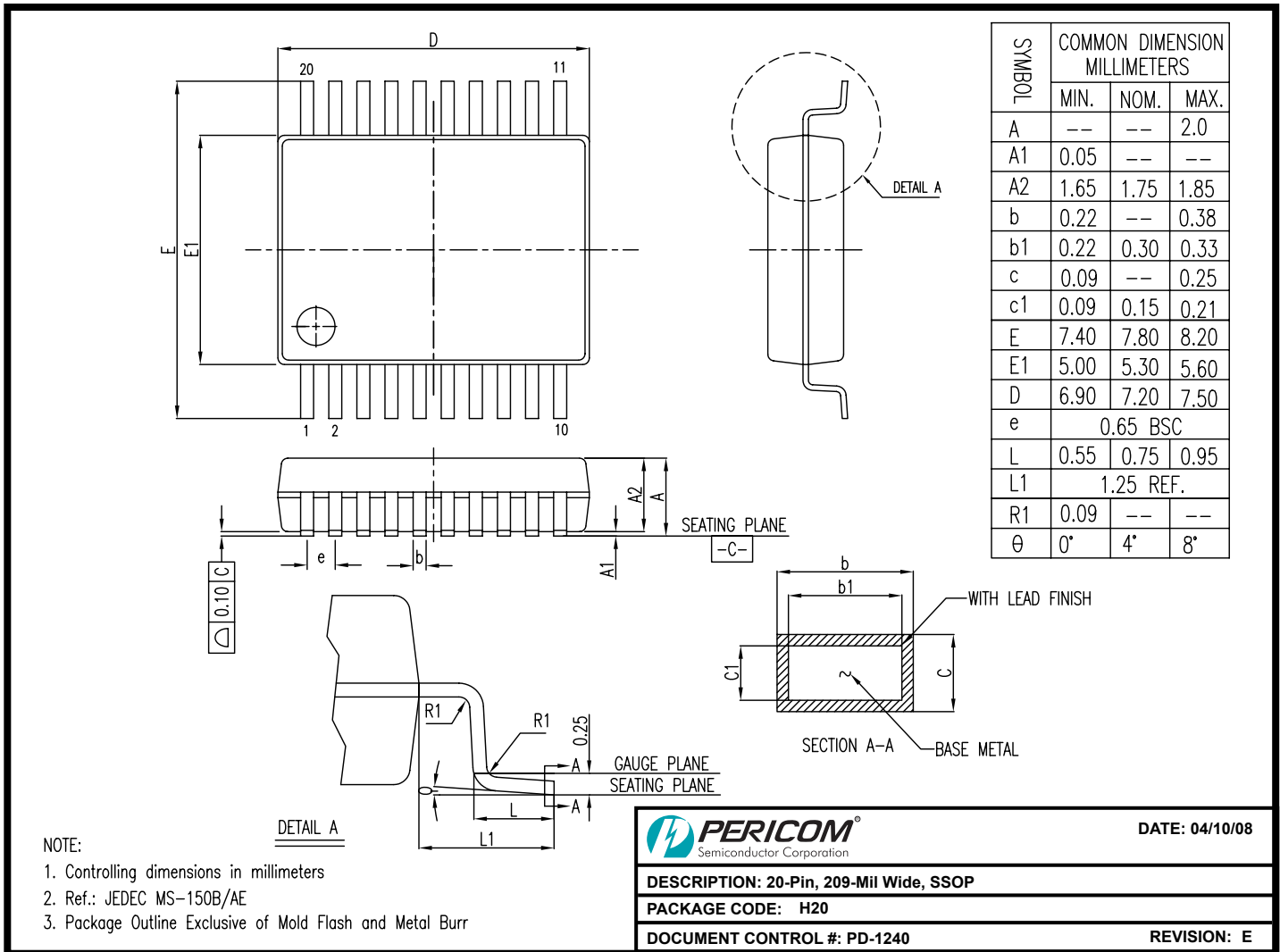


Note:

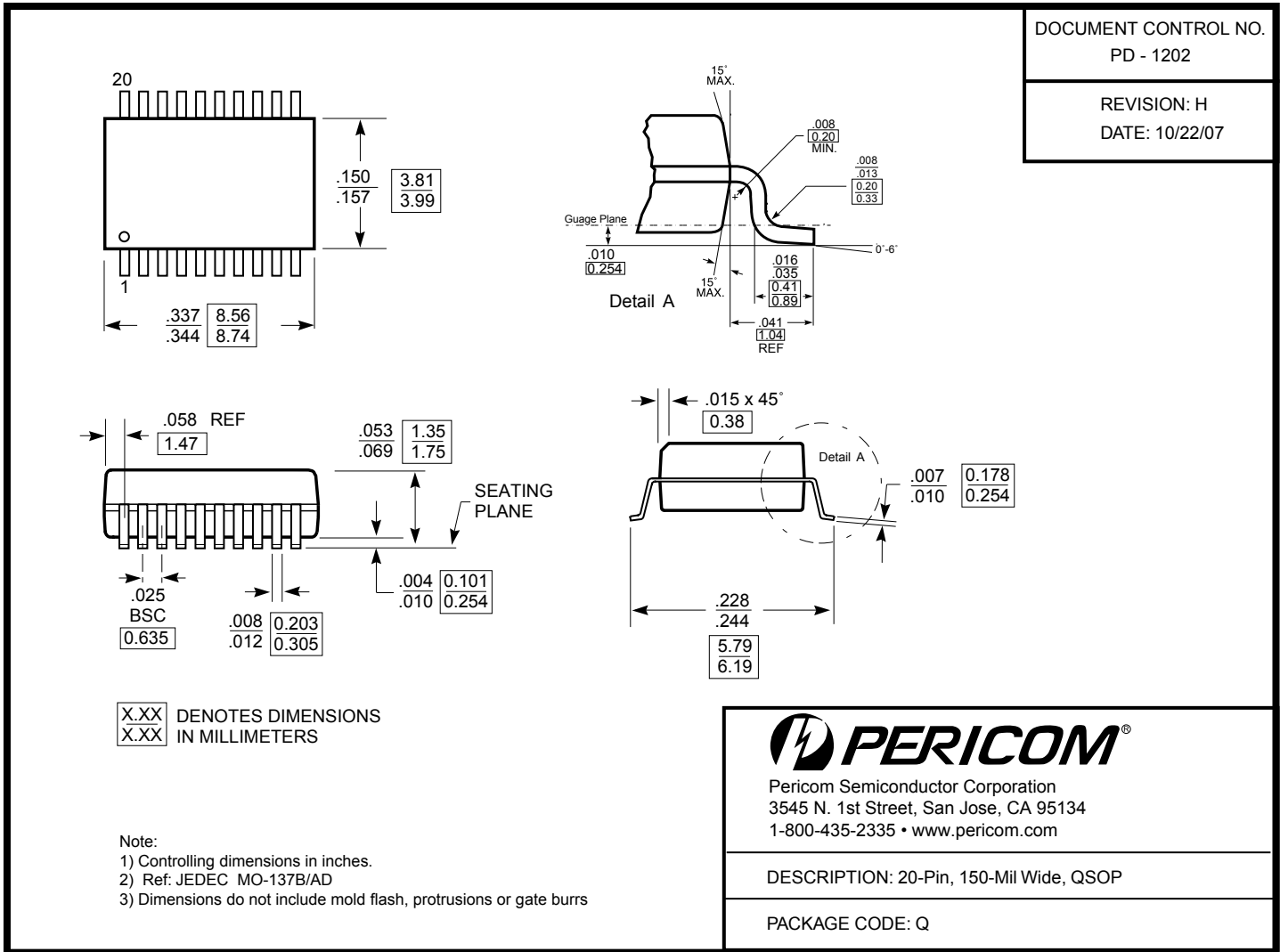
1. R_T = Termination resistance should be equal to Z_{OUT} of the Pulse Generator.

Switching Waveforms



Packaging Mechanical: 20-Pin SOIC (H)


Packaging Mechanical: 20-Pin QSOP (Q)



Ordering Information(1,2,3)

| Ordering Code | Package Code | Package Description |
|----------------|--------------|--------------------------------------|
| PI49FCT32805HE | H | Pb-free & Green, 20-pin 150-mil QSOP |
| PI49FCT32805QE | Q | Pb-free & Green, 20-pin 300-mil SOIC |

Notes:

1. Thermal characteristics can be found on the company web site at www.pericom.com/packaging/
2. E = Pb-free & Green
3. X suffix = Tape/Reel