

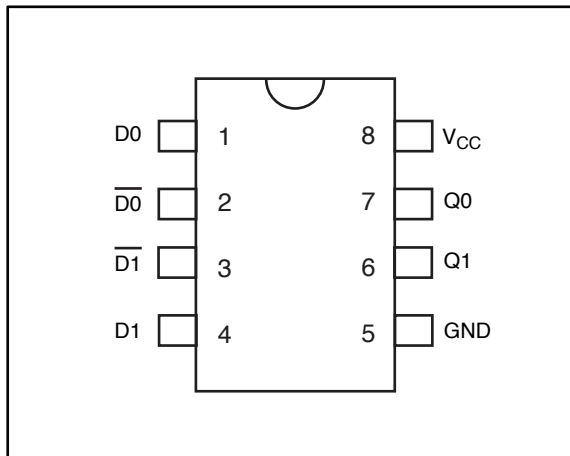
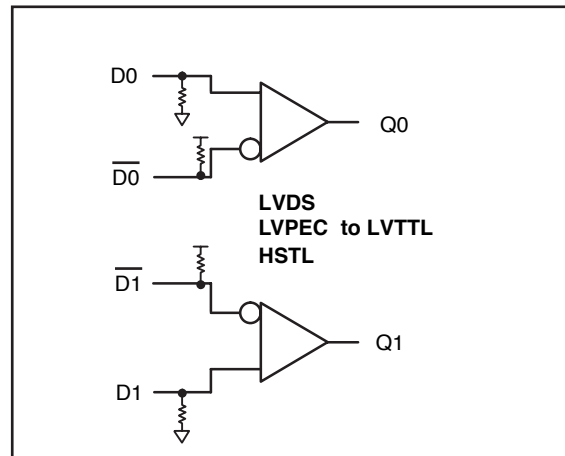
**High Frequency Noise Cancellation Translator****FEATURES:**

- Patented Technology
- Differential LVDS/LVPECL/HSTL to LVTTTL Translator
- Operating frequency up to 1GHz with 2pf load
- Operating frequency up to 800MHz with 5pf load
- Operating frequency up to 450MHz with 15pf load
- Very low output pin to pin skew < 150ps
- Propagation delay < 1.8ns max with 15pf load
- 2.4V to 3.6V power supply
- Industrial temperature range: -40°C to 85°C
- Available in 8-pin SOIC package
- Available in 8-pin TSSOP package

**DESCRIPTION:**

Potato Semiconductor's PO100HSTL23A is designed for world top performance using submicron CMOS technology to achieve 1GHz LVTTTL output frequency with less than 1.8ns propagation delay.

The PO100HSTL23A is a low-skew, The small outline 8 pin package and the low skew design to make it ideal for applications which require the translation of a clock or a data signal.

**Pin Configuration****Logic Block Diagram****Pin Description**

| Pin                                         | Function                             |
|---------------------------------------------|--------------------------------------|
| Q0, Q1                                      | LVTTTL Outputs                       |
| $\overline{D0}$ , D1<br>D0, $\overline{D1}$ | Differential LVDS/LVPECL/HSTL Inputs |
| V <sub>CC</sub>                             | Positive Supply                      |
| GND                                         | Ground                               |

**High Frequency Noise Cancellation Translator****Maximum Ratings**

| Description           | Max                          | Unit |
|-----------------------|------------------------------|------|
| Storage Temperature   | -65 to 150                   | °C   |
| Operation Temperature | -40 to 85                    | °C   |
| Operation Voltage     | -0.5 to +4.6                 | V    |
| Input Voltage         | -0.5 to V <sub>CC</sub>      | V    |
| Output Voltage        | -0.5 to V <sub>CC</sub> +0.5 | V    |

**Note:**

stresses greater than 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 specification is not implied.

**Pin Characteristics**

| Symbol                | Parameter               | Test Conditions | Minimum | Typical | Maximum | Units |
|-----------------------|-------------------------|-----------------|---------|---------|---------|-------|
| C <sub>IN</sub>       | Input Capacitance       |                 |         | 4       |         | pF    |
| R <sub>PULLUP</sub>   | Input Pullup Resistor   |                 |         | 88      |         | KΩ    |
| R <sub>PULLDOWN</sub> | Input Pulldown Resistor |                 |         | 88      |         | KΩ    |

**DC Electrical Characteristics**

| Symbol          | Description         | Test Conditions                                                                      | Min         | Typ         | Max             | Unit |
|-----------------|---------------------|--------------------------------------------------------------------------------------|-------------|-------------|-----------------|------|
| V <sub>OH</sub> | Output High voltage | V <sub>CC</sub> =3V Vin=V <sub>IH</sub> or V <sub>IL</sub> , I <sub>OH</sub> = -12mA | <b>2.4</b>  | <b>3</b>    | -               | V    |
| V <sub>OL</sub> | Output Low voltage  | V <sub>CC</sub> =3V Vin=V <sub>IH</sub> or V <sub>IL</sub> , I <sub>OH</sub> =12mA   | -           | <b>0.3</b>  | <b>0.5</b>      | V    |
| V <sub>IH</sub> | Input High voltage  | Guaranteed Logic HIGH Level (Input Pin)                                              | <b>2</b>    | -           | V <sub>CC</sub> | V    |
| V <sub>IL</sub> | Input Low voltage   | Guaranteed Logic LOW Level (Input Pin)                                               | <b>-0.5</b> | -           | <b>0.8</b>      | V    |
| I <sub>IH</sub> | Input High current  | V <sub>CC</sub> = 3.6V and Vin = V <sub>CC</sub>                                     | -           | -           | <b>1</b>        | uA   |
| I <sub>IL</sub> | Input Low current   | V <sub>CC</sub> = 3.6V and Vin = 0V                                                  | -           | -           | <b>-1</b>       | uA   |
| V <sub>IK</sub> | Clamp diode voltage | V <sub>CC</sub> = Min. And I <sub>IN</sub> = -18mA                                   | -           | <b>-0.7</b> | <b>-1.2</b>     | V    |

**Notes:**

1. For conditions shown as Max. or Min., use appropriate value specified under Electrical Characteristics for the applicable device type.
2. Typical values are at V<sub>CC</sub> = 3.3V, 25 °C ambient.
3. This parameter is guaranteed but not tested.
4. Not more than one output should be shorted at one time. Duration of the test should not exceed one second.
5. V<sub>OH</sub> = V<sub>CC</sub> – 0.6V at rated current

**High Frequency Noise Cancellation Translator****Power Supply Characteristics**

| Symbol      | Description                    | Test Conditions (1)     | Min | Typ        | Max       | Unit      |
|-------------|--------------------------------|-------------------------|-----|------------|-----------|-----------|
| <b>IccQ</b> | Quiescent Power Supply Current | Vcc=Max, Vin=Vcc or GND | -   | <b>0.1</b> | <b>30</b> | <b>uA</b> |

**Notes:**

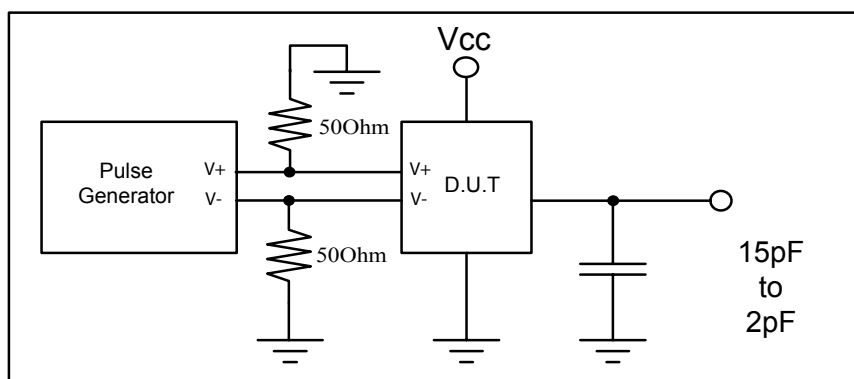
1. For conditions shown as Max. or Min., use appropriate value specified under Electrical Characteristics for the applicable device type.
2. Typical values are at Vcc = 3.3V, 25°C ambient.
3. This parameter is guaranteed but not tested.
4. Not more than one output should be shorted at one time. Duration of the test should not exceed one second.

**Switching Characteristics**

| Symbol         | Description                           | Test Conditions (1) | Max         | Unit       |
|----------------|---------------------------------------|---------------------|-------------|------------|
| <b>tPD</b>     | Propagation Delay D to Output pair    | CL = 15pF           | <b>1.8</b>  | <b>ns</b>  |
| <b>tr/tf</b>   | Rise/Fall Time                        | 0.8V – 2.0V         | <b>0.8</b>  | <b>ns</b>  |
| <b>tsk(o)</b>  | Output Pin to Pin Skew (Same Package) | CL = 15pF, 125MHz   | <b>150</b>  | <b>ps</b>  |
| <b>tsk(pp)</b> | Output Skew (Different Package)       | CL = 15pF, 125MHz   | <b>300</b>  | <b>ps</b>  |
| <b>fmax</b>    | Input Frequency                       | CL = 15pF           | <b>450</b>  | <b>MHz</b> |
| <b>fmax</b>    | Input Frequency                       | CL = 5pF            | <b>800</b>  | <b>MHz</b> |
| <b>fmax</b>    | Input Frequency                       | CL = 2pF            | <b>1000</b> | <b>MHz</b> |

**Notes:**

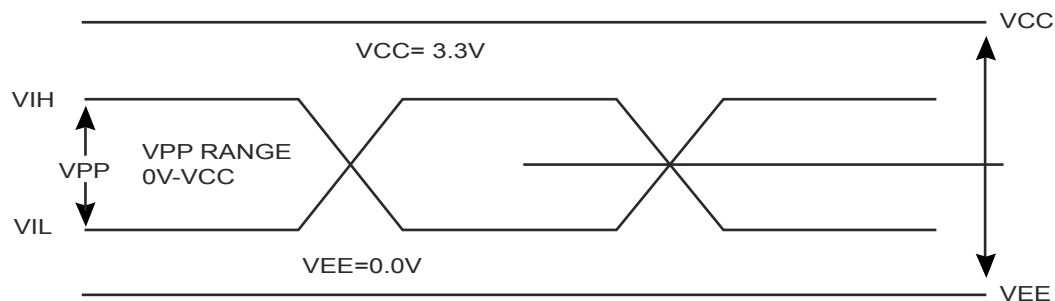
1. See test circuits and waveforms.
2. tPLH, tPHL, tsk(p), and tsk(o) are production tested. All other parameters guaranteed but not production tested.
3. Airflow of 1m/s is recommended for frequencies above 133MHz

**Test Circuit**

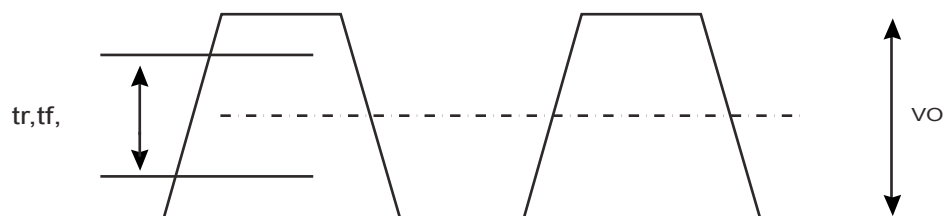
## Dual Differential LVDS/LVPECL/HSTL to LVTTTL Translator

### Test Waveforms

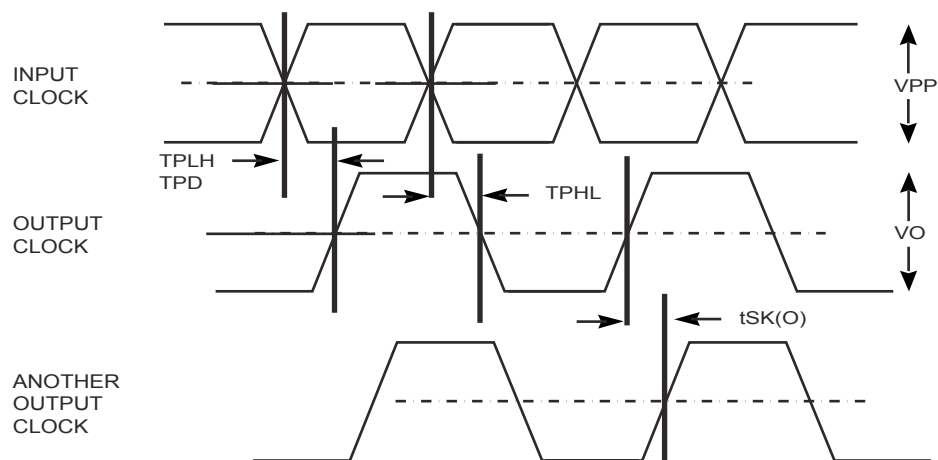
**FIGURE 1.**  
**LVDS/ PECL/ ECL/ HSTL /DIFFERENTIAL INPUT WAVEFORM DEFINITIONS**



**FIGURE 2.**  
**LVTTTL OUTPUT**



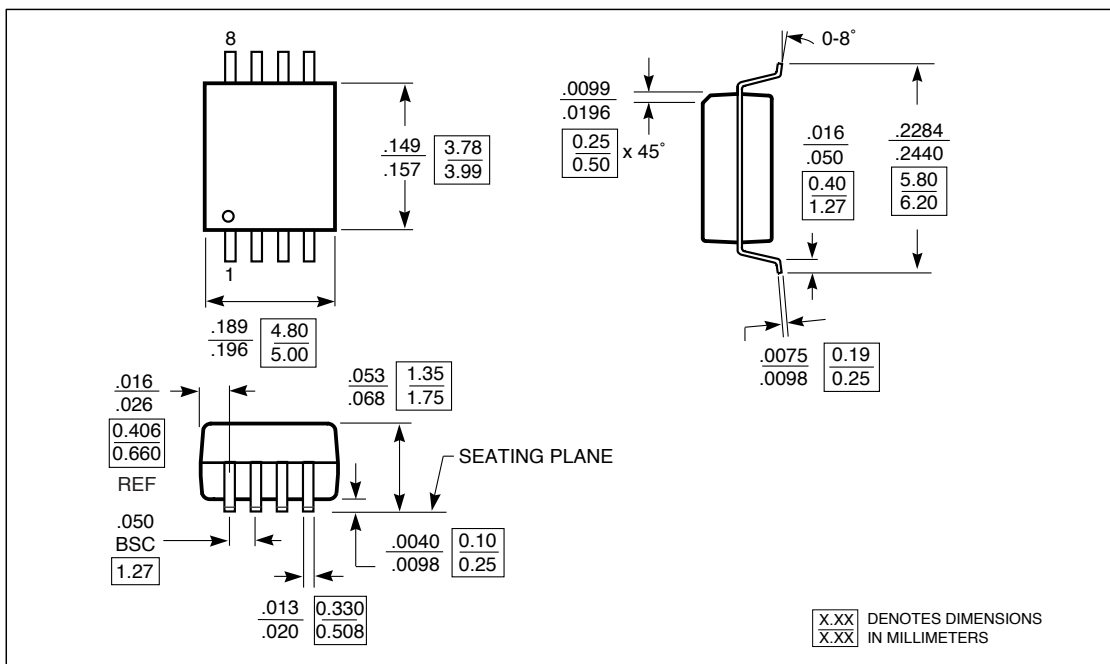
**FIGURE 3.**  
**Propagation Delay, Output pulse skew, and output-to-output skew for D to output**



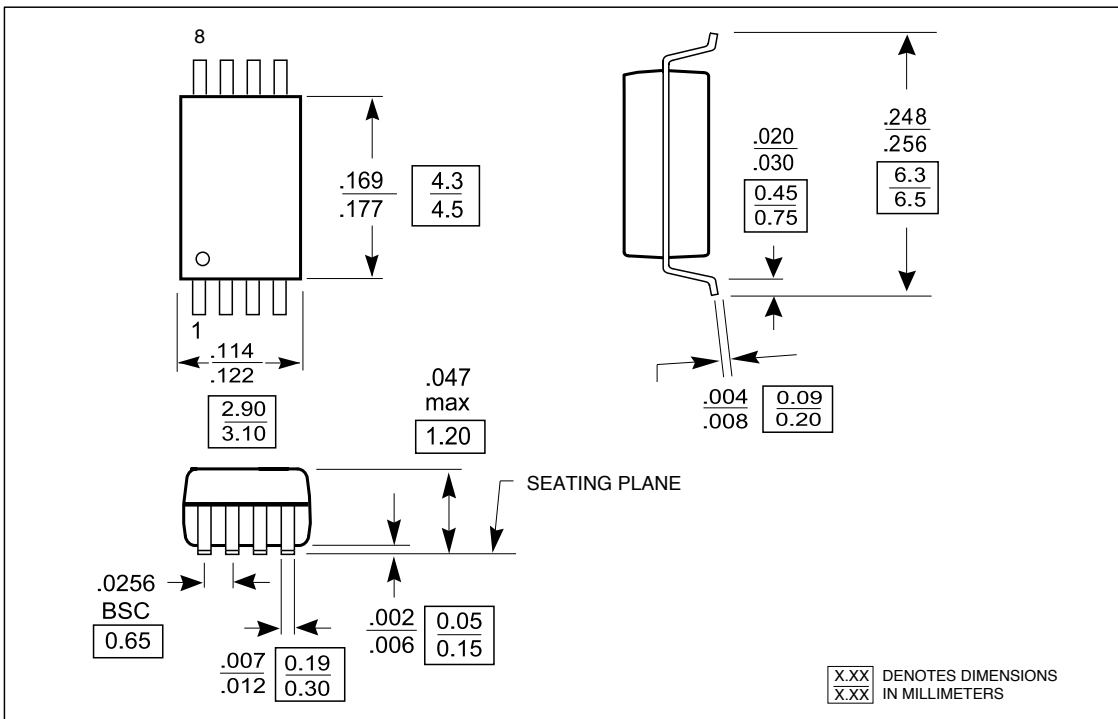


## High Frequency Noise Cancellation Translator

### Packaging Mechanical Drawing: 8 pin SOIC



### Packaging Mechanical Drawing: 8 pin TSSOP



**High Frequency Noise Cancellation Translator****IC Ordering Information**

| Ordering Code                  | Package            |                 | Top-Marking   | T <sub>A</sub> |
|--------------------------------|--------------------|-----------------|---------------|----------------|
| PO100HSTL23ASU for Tube        | 8 pin 150mil SOIC  | Pb-free & Green | PO100HSTL23AS | -40°C to 85°C  |
| PO100HSTL23ASR for Tape & Reel | 8 pin 150mil SOIC  | Pb-free & Green | PO100HSTL23AS | -40°C to 85°C  |
| PO100HSTL23ATU for Tube        | 8 pin 173mil TSSOP | Pb-free & Green | PO100HSTL23TS | -40°C to 85°C  |
| PO100HSTL23ATR for Tape & Reel | 8 pin 173mil TSSOP | Pb-free & Green | PO100HSTL23TS | -40°C to 85°C  |

**IC Package Information**

| PACKAGE CODE | PACKAGE TYPE       | TAPE WIDTH (mm) | TAPE PITCH (mm) | TAPE & REEL PIN 1 LOCATION | TAPE TRAILER LENGTH | QTY PER TAPE | TAPE LEADER LENGTH | QTY PER TUBE |
|--------------|--------------------|-----------------|-----------------|----------------------------|---------------------|--------------|--------------------|--------------|
| S            | 8-pin 150mil SOIC  | 12              | 8               | Top Left Corner            | 39 (12")            | 3000         | 64 (20")           | 97           |
| T            | 8-pin 173mil TSSOP | 12              | 8               | Top Left Corner            | 39 (12")            | 3000         | 64 (20")           | 158          |