

## FEATURES

- 3.3V power supply
- 2.0ns typical propagation delay
- <500ps typical output-to-output skew
- Differential LVPECL inputs
- 24mA LVTTL outputs
- Flow-through pinouts
- Available in 8-pin SOIC package



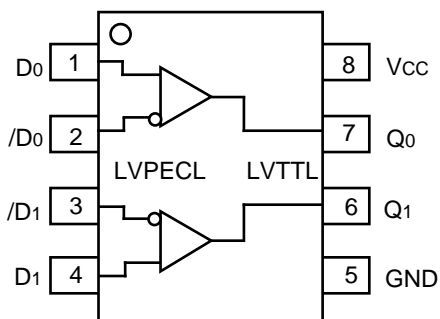
Precision Edge™

## DESCRIPTION

The SY10/100ELT23L are dual differential LVPECL-to-LVTTL translators with +3.3V power supply. Because LVPECL (Low Voltage Positive ECL) levels are used, only +3.3V and ground are required. The small outline 8-lead SOIC package and the low skew, dual gate design of the ELT23L makes it ideal for applications which require the translation of a clock and a data signal.

The ELT23L is available in both ECL standards: the 10ELT is compatible with positive ECL 10H logic levels, while the 100ELT is compatible with positive ECL 100K logic levels.

## PIN CONFIGURATION/BLOCK DIAGRAM



## PIN NAMES

| Pin             | Function                   |
|-----------------|----------------------------|
| Q <sub>n</sub>  | LVTTL Outputs              |
| D <sub>n</sub>  | Differential LVPECL Inputs |
| V <sub>CC</sub> | +3.3V Supply               |
| GND             | Ground                     |

**ABSOLUTE MAXIMUM RATINGS<sup>(1)</sup>**

| Symbol             | Parameter                               | Value                           | Unit |
|--------------------|---|---------------------------------|------|
| V <sub>CC</sub>    | Power Supply Voltage                    | -0.5 to +3.8                    | V    |
| V <sub>I</sub>     | PECL Input Voltage                      | 0V to V <sub>CC</sub> +0.5      | V    |
| V <sub>O</sub>     | Voltage Applied to Output at HIGH State | -0.5 to V <sub>CC</sub>         | V    |
| I <sub>O</sub>     | Current Applied to Output at LOW State  | Twice the Rated I <sub>OL</sub> | mA   |
| T <sub>store</sub> | Storage Temperature                     | -65 to +150                     | °C   |
| T <sub>amb</sub>   | Operating Temperature                   | -40 to +85                      | °C   |

**TRUTH TABLE**

| D    | $\bar{D}$ | Q |
|------|-----------|---|
| L    | H         | L |
| H    | L         | H |
| Open | Open      | L |

**NOTE:**

1. Permanent device damage may occur if ABSOLUTE MAXIMUM RATINGS are exceeded. This is a stress rating only and functional operation is not implied at conditions other than those detailed in the operational sections of this data sheet. Exposure to ABSOLUTE MAXIMUM RATING conditions for extended periods may affect device reliability.

**LV TTL DC ELECTRICAL CHARACTERISTICS**V<sub>CC</sub> = +3.3V ±5%

| Symbol          | Parameter                    | T <sub>A</sub> = -40°C |      | T <sub>A</sub> = 0°C |      | T <sub>A</sub> = +25°C |      | T <sub>A</sub> = +85°C |      | Unit | Condition                |
|-----------------|------------------------------|------------------------|------|----------------------|------|------------------------|------|------------------------|------|------|--------------------------|
|                 |                              | Min.                   | Max. | Min.                 | Max. | Min.                   | Max. | Min.                   | Max. |      |                          |
| V <sub>OH</sub> | Output HIGH Voltage          | 2.0                    | —    | 2.0                  | —    | 2.0                    | —    | 2.0                    | —    | V    | I <sub>OH</sub> = -3.0mA |
| V <sub>OL</sub> | Output LOW Voltage           | —                      | 0.5  | —                    | 0.5  | —                      | 0.5  | —                      | 0.5  | V    | I <sub>OL</sub> = 24mA   |
| I <sub>CC</sub> | Power Supply Current         | —                      | 30   | —                    | 30   | —                      | 30   | —                      | 30   | mA   |                          |
| I <sub>OS</sub> | Output Short Circuit Current | -80                    | -240 | -80                  | -240 | -80                    | -240 | -80                    | -240 | mA   | V <sub>OUT</sub> = 0V    |

**LV PECL DC ELECTRICAL CHARACTERISTICS**V<sub>CC</sub> = +3.3V ±5%

| Symbol           | Parameter                                 | T <sub>A</sub> = -40°C |      |                 | T <sub>A</sub> = 0°C |      |                 | T <sub>A</sub> = +25°C |      |                 | T <sub>A</sub> = +85°C |      |                 | Unit |
|------------------|---|------------------------|------|-----------------|----------------------|------|-----------------|------------------------|------|-----------------|------------------------|------|-----------------|------|
|                  |   | Min.                   | Typ. | Max.            | Min.                 | Typ. | Max.            | Min.                   | Typ. | Max.            | Min.                   | Typ. | Max.            |      |
| I <sub>IH</sub>  | Input HIGH Current                        | —                      | —    | 150             | —                    | —    | 150             | —                      | —    | 150             | —                      | —    | 150             | μA   |
| I <sub>IL</sub>  | Input LOW Current                         | 0.5                    | —    | —               | 0.5                  | —    | —               | 0.5                    | —    | —               | 0.5                    | —    | —               | μA   |
| V <sub>CMR</sub> | Common Mode Range                         | 1.5                    | —    | V <sub>CC</sub> | 1.5                  | —    | V <sub>CC</sub> | 1.5                    | —    | V <sub>CC</sub> | 1.5                    | —    | V <sub>CC</sub> | V    |
| V <sub>PP</sub>  | Minimum Peak-to-Peak Input <sup>(1)</sup> | 200                    | —    | —               | 200                  | —    | —               | 200                    | —    | —               | 200                    | —    | —               | mV   |
| V <sub>IH</sub>  | Input HIGH Voltage <sup>(2)</sup>         | 2070                   | —    | 2410            | 2130                 | —    | 2460            | 2170                   | —    | 2490            | 2130                   | —    | 2565            | mV   |
|                  | 10ELT                                     | 2070                   | —    | 2410            | 2130                 | —    | 2460            | 2170                   | —    | 2490            | 2130                   | —    | 2565            |      |
|                  | 100ELT                                    | 2135                   | —    | 2420            | 2135                 | —    | 2420            | 2135                   | —    | 2420            | 2135                   | —    | 2420            |      |
| V <sub>IL</sub>  | Input LOW Voltage <sup>(2)</sup>          | 1350                   | —    | 1800            | 1350                 | —    | 1820            | 1350                   | —    | 1820            | 1350                   | —    | 1820            | mV   |
|                  | 10ELT                                     | 1350                   | —    | 1800            | 1350                 | —    | 1820            | 1350                   | —    | 1820            | 1350                   | —    | 1820            |      |
|                  | 100ELT                                    | 1490                   | —    | 1825            | 1490                 | —    | 1825            | 1490                   | —    | 1825            | 1490                   | —    | 1825            |      |

**NOTES:**

1. 200mV input guarantees full logic at output.
2. These values are for V<sub>CC</sub> = 3.3V. Level Specifications will vary 1:1 with V<sub>CC</sub>.

**AC ELECTRICAL CHARACTERISTICS**

VCC = +3.3V ±5%

| Symbol       | Parameter                                | TA = -40°C |      | TA = 0°C |      | TA = +25°C |      | TA = +85°C |      | Unit | Condition |
|--------------|--|------------|------|----------|------|------------|------|------------|------|------|-----------|
|              |  | Min.       | Max. | Min.     | Max. | Min.       | Max. | Min.       | Max. |      |           |
| tPLH<br>tPHL | Propagation Delay                        | 1.5        | 2.5  | 1.5      | 2.5  | 1.5        | 2.5  | 1.5        | 2.5  | ns   | CL = 20pF |
| tskpp        | Part-to-Part Skew <sup>(1,4)</sup>       | —          | 0.5  | —        | 0.5  | —          | 0.5  | —          | 0.5  | ns   | CL = 20pF |
| tskew++      | Within-Device Skew <sup>(2,4)</sup>      | —          | 0.3  | —        | 0.3  | —          | 0.3  | —          | 0.3  | ns   | CL = 20pF |
| tskew--      | Within-Device Skew <sup>(3,4)</sup>      | —          | 0.3  | —        | 0.3  | —          | 0.3  | —          | 0.3  | ns   | CL = 20pF |
| tr<br>tf     | Output Rise/Fall Time<br>1.0V to 2.0V    | 0.5        | 1.0  | 0.5      | 1.0  | 0.5        | 1.0  | 0.5        | 1.0  | ns   | CL = 20pF |
| fMAX         | Maximum Input Frequency <sup>(5,6)</sup> | 160        | —    | 160      | —    | 160        | —    | 160        | —    | MHz  | CL = 20pF |

**NOTES:**

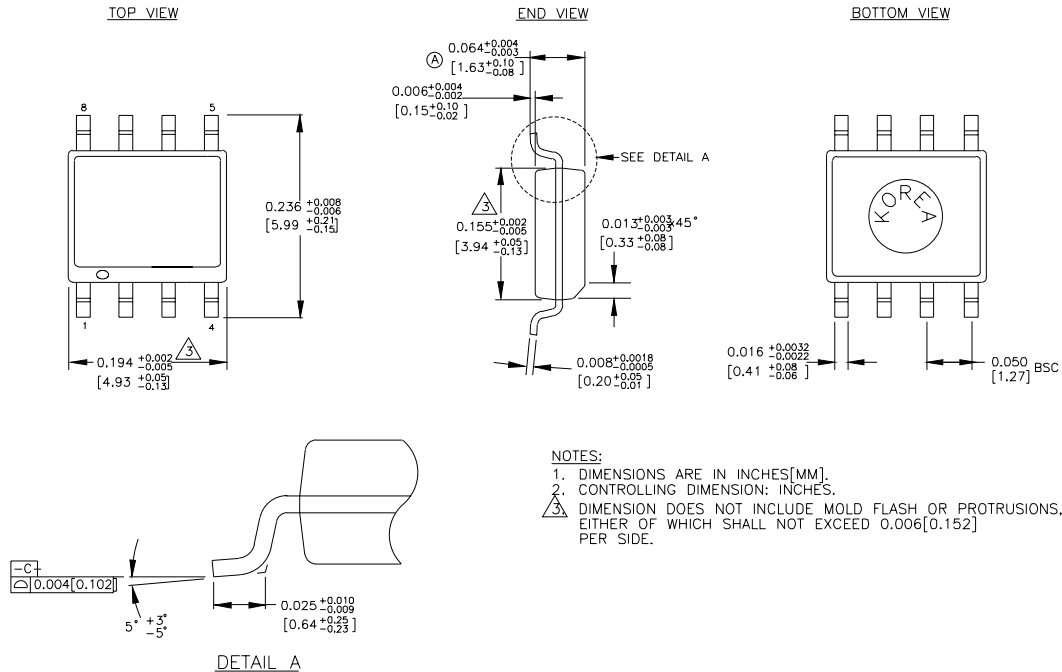
1. Device-to-Device Skew considering HIGH-to-HIGH transitions at common Vcc level.
2. Within-Device Skew considering HIGH-to-HIGH transitions at common Vcc level.
3. Within-Device Skew considering LOW-to-LOW transitions at common Vcc level.
4. All skew parameters are guaranteed but not tested.
5. Frequency at which output levels will meet a 0.8V to 2.0V minimum swing.
6. The fMAX value is specified as the minimum guaranteed maximum frequency. Actual operational maximum frequency may be greater.

**PRODUCT ORDERING CODE**

| Ordering Code    | Package Type | Operating Range | Marking Code | Ordering Code                   | Package Type | Operating Range | Marking Code |
|------------------|--------------|-----------------|--------------|---------------------------------|--------------|-----------------|--------------|
| SY10ELT23LZC     | Z8-1         | Commercial      | HEL23L       | SY10ELT23LZI <sup>(1)</sup>     | Z8-1         | Industrial      | HEL23L       |
| SY10ELT23LZCTR*  | Z8-1         | Commercial      | HEL23L       | SY10ELT23LZITR* <sup>(1)</sup>  | Z8-1         | Industrial      | HEL23L       |
| SY100ELT23LZC    | Z8-1         | Commercial      | XEL23L       | SY100ELT23LZI <sup>(1)</sup>    | Z8-1         | Industrial      | XEL23L       |
| SY100ELT23LZCTR* | Z8-1         | Commercial      | XEL23L       | SY100ELT23LZITR* <sup>(1)</sup> | Z8-1         | Industrial      | XEL23L       |

\*Tape and Reel

**Note 1.** Recommended for new designs.

**8 LEAD SOIC .150" WIDE (Z8-1)**

Rev. 03

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