

### FEATURES

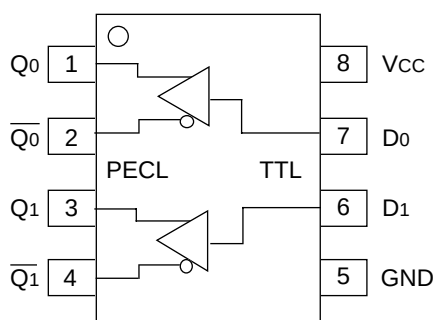
- 300ps typical propagation delay
- <100ps output-to-output skew
- Differential PECL outputs
- PNP TTL inputs for minimal loading
- Flow-through pinouts
- Available in 8-pin SOIC package

### DESCRIPTION

The SY10/100ELT22 are dual TTL-to-differential PECL translators. Because PECL (Positive ECL) levels are used, only +5V and ground are required. The small outline 8-lead SOIC package and the low skew, dual gate design of the ELT22 makes it ideal for applications which require the translation of a clock and a data signal.

The ELT22 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



SOIC  
TOP VIEW

### PIN NAMES

| Pin   | Function                  |
|-------|---------------------------|
| $Q_n$ | Differential PECL Outputs |
| $D_n$ | TTL Inputs                |
| Vcc   | +5.0V Supply              |
| GND   | Ground                    |

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

| Symbol             | Parameter                                      | Value                   | Unit |
|--------------------|------------------------------------------------|-------------------------|------|
| V <sub>CC</sub>    | Power Supply Voltage                           | −0.5 to +7.0            | V    |
| V <sub>I</sub>     | TTL Input Voltage                              | −0.5 to V <sub>CC</sub> | V    |
| I <sub>I</sub>     | TTL Input Current                              | −30 to +5.0             | mA   |
| I <sub>OUT</sub>   | PECL Output Current<br>— Continuous<br>— Surge | 50<br>100               | mA   |
| T <sub>store</sub> | Storage Temperature                            | −65 to +150             | °C   |
| T <sub>A</sub>     | Operating Temperature                          | −40 to +85              | °C   |
| ESD                | Mil Std. 883 Human Body Model, All Pins        | >1.5k                   | V    |

**TRUTH TABLE**

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

**DC ELECTRICAL CHARACTERISTICS<sup>(1)</sup>**V<sub>CC</sub> = V<sub>CC</sub> (Min.) to V<sub>CC</sub> (Max.)

| 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. |      |           |
| I <sub>CC</sub> | Power Supply Current | —                      | 30   | —                    | 30   | —                      | 30   | —                      | 30   | mA   | —         |

**Note 1.** Parametric values specified at: 5 volt Power Supply Range 100ELT22 Series: +4.2V to +5.5V.  
10ELT22 Series +4.75V to +5.5V.

**AC ELECTRICAL CHARACTERISTICS<sup>(1)</sup>**V<sub>CC</sub> = V<sub>CC</sub> (Min.) to V<sub>CC</sub> (Max.)

| 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. |      |                               |
| t <sub>PLH</sub><br>t <sub>PHL</sub> | Propagation Delay to Output D, ENECL/ENTTL | 100                    | 600  | 100                  | 600  | 100                    | 600  | 100                    | 600  | ps   | 50Ω to V <sub>CC</sub> − 2.0V |
| t <sub>r</sub><br>t <sub>f</sub>     | Output Rise/Fall Time<br>20% to 80%        | 200                    | 500  | 200                  | 500  | 200                    | 500  | 200                    | 500  | ps   | 50Ω to V <sub>CC</sub> − 2.0V |
| t <sub>skpp</sub>                    | Part-to-Part Skew <sup>(2)</sup>           | —                      | 500  | —                    | 500  | —                      | 500  | —                      | 500  | ps   | 50Ω to V <sub>CC</sub> − 2.0V |
| t <sub>skew</sub>                    | Within-Device Skew <sup>(2,3)</sup>        | —                      | 100  | —                    | 100  | —                      | 100  | —                      | 100  | ps   | 50Ω to V <sub>CC</sub> − 2.0V |

**Note 1.** Parametric values specified at: 5 volt Power Supply Range 100ELT22 Series: +4.2V to +5.5V.  
10ELT22 Series +4.75V to +5.5V.

**Note 2.** Guaranteed, but not tested.

**Note 3.** Same transition @common VCC levels.

**TTL DC ELECTRICAL CHARACTERISTICS<sup>(1)</sup>**V<sub>CC</sub> = V<sub>CC</sub> (Min.) to V<sub>CC</sub> (Max.)

| 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>IH</sub> | Input HIGH Voltage  | 2.0                    | —         | 2.0                  | —         | 2.0                    | —         | 2.0                    | —         | V    | —                                                           |
| V <sub>IL</sub> | Input LOW Voltage   | —                      | 0.8       | —                    | 0.8       | —                      | 0.8       | —                      | 0.8       | V    | —                                                           |
| I <sub>IH</sub> | Input HIGH Current  | —                      | 20<br>100 | —                    | 20<br>100 | —                      | 20<br>100 | —                      | 20<br>100 | μA   | V <sub>IN</sub> = 2.7V<br>V <sub>IN</sub> = V <sub>CC</sub> |
| I <sub>IL</sub> | Input LOW Current   | —                      | -0.2      | —                    | -0.2      | —                      | -0.2      | —                      | -0.2      | mA   | V <sub>IN</sub> = 0.5V                                      |
| V <sub>IK</sub> | Input Clamp Voltage | —                      | -1.2      | —                    | -1.2      | —                      | -1.2      | —                      | -1.2      | V    | I <sub>IN</sub> = -18mA                                     |

**Note 1.** Parametric values specified at: 5 volt Power Supply Range 100ELT22 Series: +4.2V to +5.5V.  
10ELT22 Series +4.75V to +5.5V.

**PECL DC ELECTRICAL CHARACTERISTICS<sup>(1)</sup>**V<sub>CC</sub> = V<sub>CC</sub> (Min.) to V<sub>CC</sub> (Max.)

| 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. |      |
| V <sub>OH</sub> | Output HIGH Voltage <sup>(2)</sup> |                        |      |      |                      |      |      |                        |      |      |                        |      |      | mV   |
|                 | 10ELT                              | 3920                   | —    | 4110 | 3980                 | —    | 4160 | 4020                   | —    | 4190 | 4090                   | —    | 4280 |      |
|                 | 100ELT                             | 3915                   | —    | 4120 | 3975                 | —    | 4120 | 3975                   | —    | 4120 | 3975                   | —    | 4120 |      |
| V <sub>OL</sub> | Output LOW Voltage <sup>(2)</sup>  |                        |      |      |                      |      |      |                        |      |      |                        |      |      | mV   |
|                 | 10ELT                              | 3050                   | —    | 3350 | 3050                 | —    | 3370 | 3050                   | —    | 3370 | 3050                   | —    | 3405 |      |
|                 | 100ELT                             | 3170                   | —    | 3445 | 3190                 | —    | 3380 | 3190                   | —    | 3380 | 3190                   | —    | 3380 |      |

**Note 1.** Parametric values specified at: 5 volt Power Supply Range 100ELT22 Series: +4.2V to +5.5V.  
10ELT22 Series +4.75V to +5.5V.

**Note 2.** These values are for V<sub>CC</sub> = 5.0V. Level Specifications will vary 1:1 with V<sub>CC</sub>.

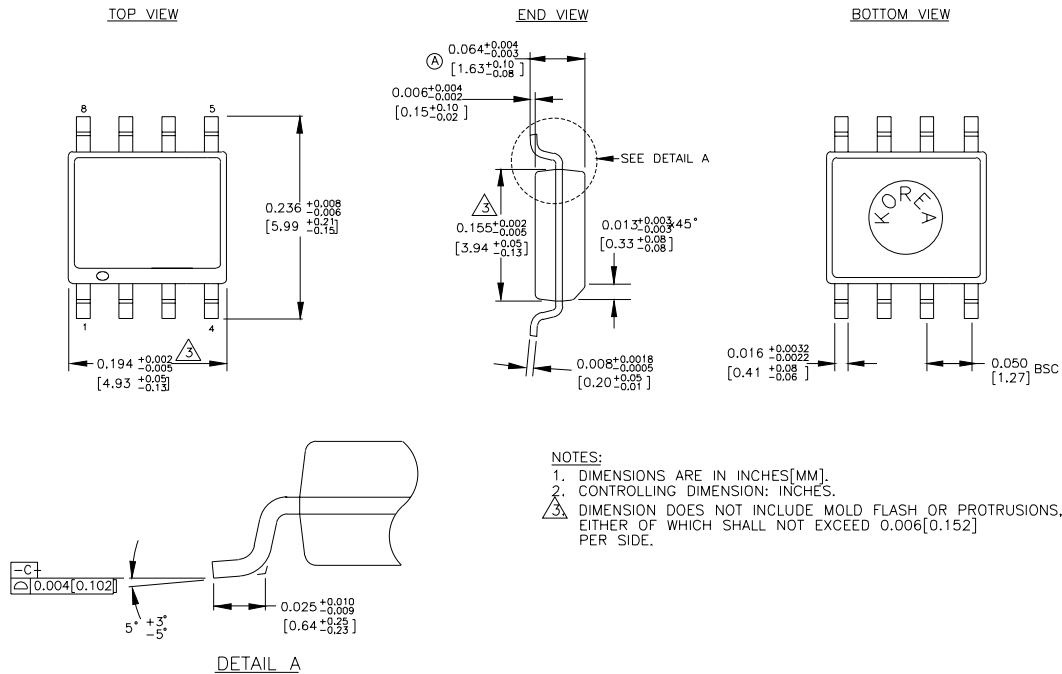
**PRODUCT ORDERING CODE**

| Ordering Code                 | Package Type | Operating Range | Marking Code |
|-------------------------------|--------------|-----------------|--------------|
| SY10ELT22ZC                   | Z8-1         | Commercial      | HEL22        |
| SY10ELT22ZCTR <sup>(1)</sup>  | Z8-1         | Commercial      | HEL22        |
| SY100ELT22ZC                  | Z8-1         | Commercial      | XEL22        |
| SY100ELT22ZCTR <sup>(1)</sup> | Z8-1         | Commercial      | XEL22        |

| Ordering Code                    | Package Type | Operating Range | Marking Code |
|----------------------------------|--------------|-----------------|--------------|
| SY10ELT22ZI <sup>(2)</sup>       | Z8-1         | Industrial      | HEL22        |
| SY10ELT22ZITR <sup>(1, 2)</sup>  | Z8-1         | Industrial      | HEL22        |
| SY100ELT22ZI <sup>(1)</sup>      | Z8-1         | Industrial      | XEL22        |
| SY100ELT22ZITR <sup>(1, 2)</sup> | Z8-1         | Industrial      | XEL22        |

**Note 1.** Tape and Reel.

**Note 2.** Recommended for new designs.

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

Rev. 03

**Package Notes:****Note 1.** Package meets Level 1 moisture sensitivity.**MICREL, INC. 1849 FORTUNE DRIVE SAN JOSE, CA 95131 USA**TEL + 1 (408) 944-0800 FAX + 1 (408) 944-0970 WEB <http://www.micrel.com>

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