



# 5V/3.3V TTL-TO-DIFFERENTIAL PECL TRANSLATOR

Precision Edge™  
SY10ELT20V  
SY100ELT20V

## FEATURES

- 3.3V and 5V power supply options
- 300ps typical propagation delay
- Low power
- Differential PECL output
- PNP TTL input for minimal loading
- Flow-through pinouts
- Available in 8-pin SOIC package and in die form



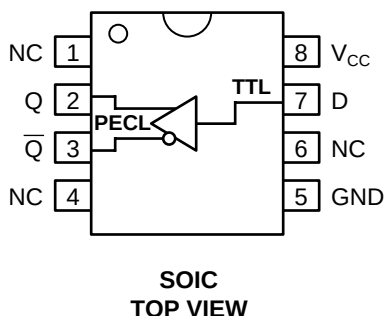
Precision Edge™

## DESCRIPTION

The SY10/100ELT20V is a single TTL-to-differential PECL translator. Because PECL (Positive ECL) levels are used, either +5V or +3.3V and ground are required. The small outline 8-lead SOIC package and low skew single gate design make the ELT20V ideal for applications that require the translation of a clock or data signal where minimal space, low power, and low cost are critical.

The ELT20V 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   | Differential PECL Output |
| D   | TTL Input                |
| Vcc | +5V/+3.3V Supply         |
| GND | Ground                   |

**ABSOLUTE MAXIMUM RATINGS**(Note 1)

| 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   |

**TRUTH TABLE**

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

**DC ELECTRICAL CHARACTERISTICS**V<sub>CC</sub> = +3.3V ±10% or +5.0V ±10%

| 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.                   | Typ. | Max. | Min.                   | Max. |      |           |
| I <sub>CC</sub> | Power Supply Current | —                      | 20   | —                    | 20   | —                      | —    | 20   | —                      | 20   | mA   | —         |

**TTL DC ELECTRICAL CHARACTERISTICS**V<sub>CC</sub> = +3.3V ±10% or +5.0V ±10%

| 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.                   | Typ. | 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                                     |

**PECL DC ELECTRICAL CHARACTERISTICS**V<sub>CC</sub> = +3.3V ±10% or +5.0V ±10%

| 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.                   | Typ. | Max. | Min.                   | Max. |      |           |
| V <sub>OH</sub> | Output HIGH Voltage <sup>(Note 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>(1)</sup>       |                        |      |                      |      |                        |      |      |                        |      | mV   |           |
|                 | 10ELT                                   | 3050                   | 3350 | 3050                 | 3370 | 3050                   | —    | 3370 | 3050                   | 3405 |      |           |
|                 | 100ELT                                  | 3170                   | 3445 | 3190                 | 3380 | 3190                   | —    | 3380 | 3190                   | 3380 |      |           |

**AC ELECTRICAL CHARACTERISTICS**(Note 3)

VCC = +3.3V ±10% or +5.0V ±10%

| Symbol       | Parameter                             | TA = -40°C |      | TA = 0°C |      | TA = +25°C |      |      | TA = +85°C |      | Unit | Condition         |
|--------------|---------------------------------------|------------|------|----------|------|------------|------|------|------------|------|------|-------------------|
|              |                                       | Min.       | Max. | Min.     | Max. | Min.       | Typ. | Max. | Min.       | Max. |      |                   |
| tPLH<br>tPHL | Propagation Delay <sup>(Note 3)</sup> | 100        | 600  | 100      | 600  | 100        | —    | 600  | 100        | 600  | ps   | 50Ω to VCC – 2.0V |
| tskpp        | Part-to-Part Skew <sup>(Note 4)</sup> | —          | 500  | —        | 500  | —          | —    | 500  | —          | 500  | ps   | 50Ω to VCC – 2.0V |
| fMAX         | Maximum Input Frequency               | 350        | —    | 350      | —    | 350        | —    | —    | 350        | —    | MHz  | 50Ω to VCC – 2.0V |
| tr<br>tf     | Output Rise/Fall Time<br>(20% to 80%) | 200        | 500  | 200      | 500  | 200        | —    | 500  | 200        | 500  | ps   | 50Ω to VCC – 2.0V |

**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.

**Note 2.** These values are for VCC = 5.0V. Level Specifications will vary 1:1 with VCC.

**Note 3.** Input Rise Time < 1.0ns.

**Note 4.** Guaranteed by design. Not tested in production.

**PRODUCT ORDERING INFORMATION**(NOTE 1)

| Ordering Code                  | Package Type | Operating Range | Marking Code |
|--------------------------------|--------------|-----------------|--------------|
| SY10ELT20VZC                   | Z8-1         | Commercial      | HEL20V       |
| SY10ELT20VZCTR <sup>(3)</sup>  | Z8-1         | Commercial      | HEL20V       |
| SY100ELT20VZC                  | Z8-1         | Commercial      | XEL20V       |
| SY100ELT20VZCTR <sup>(3)</sup> | Z8-1         | Commercial      | XEL20V       |

| Ordering Code                    | Package Type | Operating Range | Marking Code |
|----------------------------------|--------------|-----------------|--------------|
| SY10ELT20VZI <sup>(2)</sup>      | Z8-1         | Industrial      | HEL20V       |
| SY10ELT20VZITR <sup>(2,3)</sup>  | Z8-1         | Industrial      | HEL20V       |
| SY100ELT20VZI <sup>(2)</sup>     | Z8-1         | Industrial      | XEL20V       |
| SY100ELT20VZITR <sup>(2,3)</sup> | Z8-1         | Industrial      | XEL20V       |
| SY100ELT20VXC                    | DIE          | 25°C            | —            |

## TOPOGRAPHIES AND PAD COORDINATES

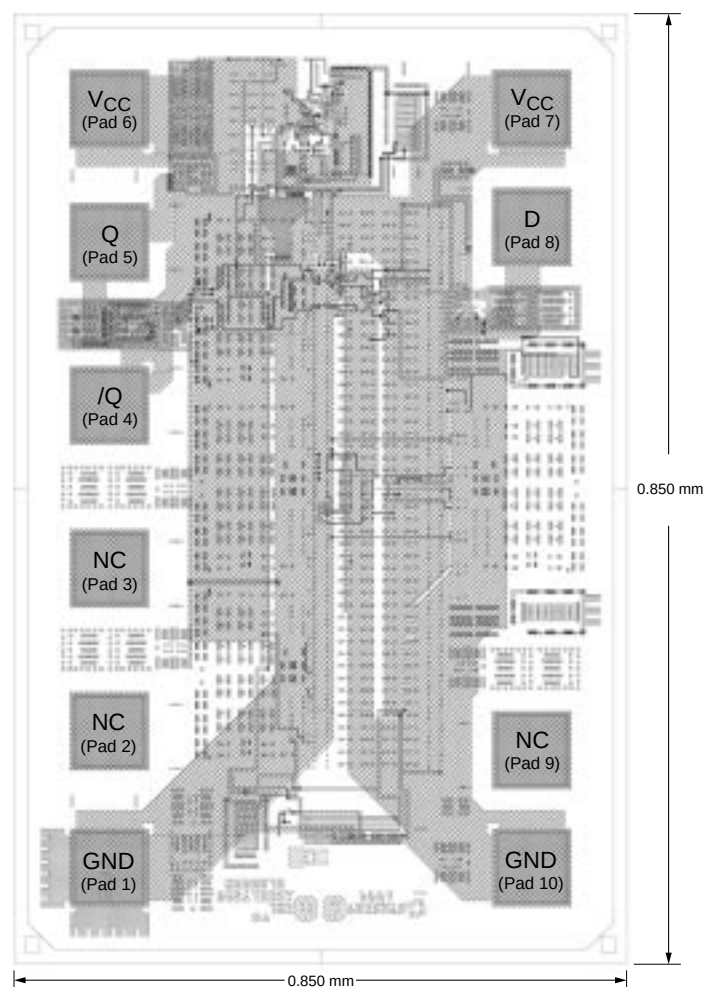


Figure 1. Chip Topographies

### PAD COORDINATES TABLE

| Pad Number | Coordinates ( $\mu\text{m}$ ) <sup>(4)</sup> |
|------------|----------------------------------------------|
| 1          | 619.5, -344.5                                |
| 2          | 396.5, -344.5                                |
| 3          | 130.5, -344.5                                |
| 4          | -135.5, -344.5                               |
| 5          | -401.5, -344.5                               |
| 6          | -619.5, -344.5                               |
| 7          | -619.5, 344.5                                |
| 8          | -427.5, 344.5                                |
| 9          | 427.5, 344.5                                 |
| 10         | 619.5, 344.5                                 |

### CHIP INFORMATION

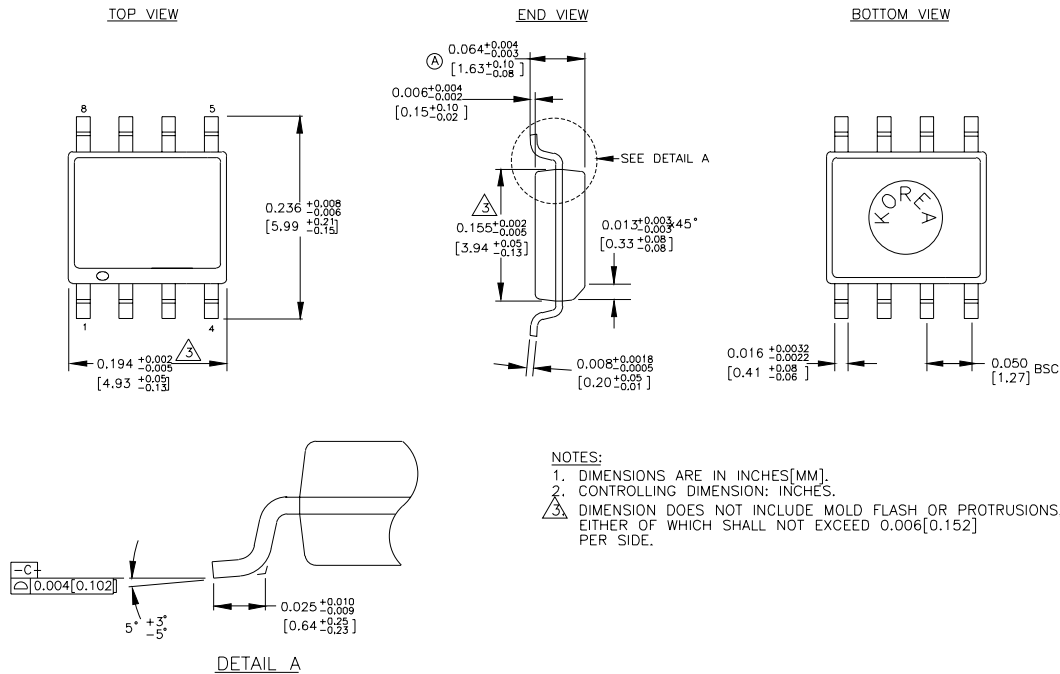
|                   |                |
|-------------------|----------------|
| Transistor Count: | 98             |
| Substrate:        | Connect to GND |
| Process:          | Bipolar        |

**Note 1.** Contact factory for die availability. Die is guaranteed at  $T_A = 25^\circ\text{C}$ , DC electricals only. Shipped in waffle pack.

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

**Note 3.** Tape and Reel.

**Note 4.** Coordinates reference from the center of the die.

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

Rev.03

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