



DIFFERENTIAL ECL-to-TTL TRANSLATOR

SY100ELT25

FEATURES

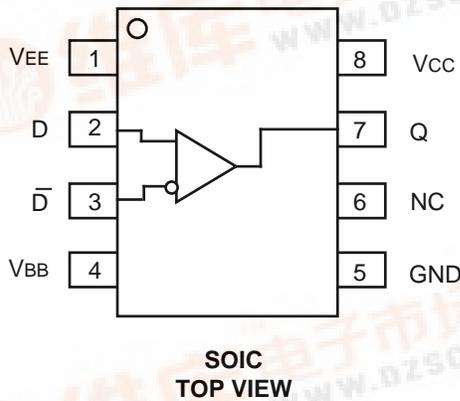
- 2.6ns typical propagation delay
- Differential ECL inputs
- 24mA TTL outputs
- Flow-through pinouts
- Available in 8-pin SOIC package

DESCRIPTION

The SY100ELT25 is a differential ECL-to-TTL translator. Because ECL levels are used, a +5V, -5.2V (or -4.5V) and ground are required. The small outline 8-lead SOIC package and the single gate of the ELT25 makes it ideal for those applications where performance, space and low power are at a premium.

The VBB output allows the ELT25 to also be used in a single-ended input mode. In this mode the VBB output is tied to the \bar{D} input for a non-inverting buffer or the D input for an inverting buffer. If used the VBB pin should be bypassed to ground via a 0.01 μ F capacitor.

PIN CONFIGURATION/BLOCK DIAGRAM



PIN NAMES

| Pin | Function |
|-----|-------------------------|
| Q | TTL Output |
| D | Differential ECL Inputs |
| Vcc | Positive Supply |
| VEE | Negative Supply |
| VBB | Reference Output |
| GND | Ground |

ABSOLUTE MAXIMUM RATINGS⁽¹⁾

| Symbol | Parameter | Value | Unit |
|--------------------|---|---------------------------------|------|
| V _{CC} | Power Supply Voltage | -0.5 to +7.0 | V |
| V _{IN} | ECL Input Voltage | V _{EE} to GND+0.5 | V |
| V _{OUT} | Voltage Applied to Output at HIGH State | -0.5 to +5.5 | V |
| I _{OUT} | Current Applied to Output at LOW State | Twice the Rated I _{OL} | mA |
| T _{store} | Storage Temperature | -65 to +150 | °C |
| T _A | Operating Temperature | -40 to +85 | °C |

TRUTH TABLE

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

NOTE:

- 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 CHARACTERISTICSV_{CC} = 4.5V to 5.5V; V_{EE} = -4.2V to -5.5V

| Symbol | Parameter | T _A = -40°C | | T _A = 0°C | | T _A = +25°C | | T _A = +85°C | | Unit | Condition |
|-----------------|----------------------|------------------------|------|----------------------|------|------------------------|------|------------------------|------|------|-----------|
| | | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | | |
| I _{CC} | Power Supply Current | — | 14 | — | 14 | 9 | 14 | — | 14 | mA | — |
| I _{EE} | Power Supply Current | — | 14 | — | 14 | 5.5 | 14 | — | 14 | mA | — |

AC ELECTRICAL CHARACTERISTICSV_{CC} = 4.5V to 5.5V; V_{EE} = -4.2V to -5.5V

| Symbol | Parameter | T _A = -40°C | | T _A = 0°C | | T _A = +25°C | | T _A = +85°C | | Unit | Condition |
|--------------------------------------|---|------------------------|------|----------------------|------|------------------------|------|------------------------|------|------|-----------------------|
| | | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | | |
| t _{PLH} t _{PHL} | Propagation Delay D to Output Q | 1.7 | 3.6 | 1.7 | 3.6 | 1.7 | 3.6 | 1.7 | 3.6 | ns | C _L = 20pF |
| f _{MAX} | Maximum Frequency | 150 | — | 150 | — | 150 | — | 150 | — | MHz | C _L = 20pF |
| t _r t _f | Output Rise/Fall Time (1.0V to 2.0V) | — | 1.5 | — | 1.5 | — | 1.5 | — | 1.5 | ns | C _L = 20pF |

TTL DC ELECTRICAL CHARACTERISTICSV_{CC} = 4.5V to 5.5V; V_{EE} = -4.2V to -5.5V

| Symbol | Parameter | T _A = -40°C | | T _A = 0°C | | T _A = +25°C | | T _A = +85°C | | Unit | Condition |
|-----------------|------------------------------|------------------------|------|----------------------|------|------------------------|------|------------------------|------|------|--------------------------|
| | | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | | |
| V _{OH} | Output HIGH Voltage | 2.4 | — | 2.4 | — | 2.4 | — | 2.4 | — | V | I _{OH} = -3.0mA |
| V _{OL} | Output LOW Voltage | — | 0.5 | — | 0.5 | — | 0.5 | — | 0.5 | V | I _{OL} = 24mA |
| I _{OS} | Output Short Circuit Current | -60 | -200 | -60 | -200 | -60 | -200 | -60 | -200 | mA | V _{OUT} = 0V |

ECL DC ELECTRICAL CHARACTERISTICS

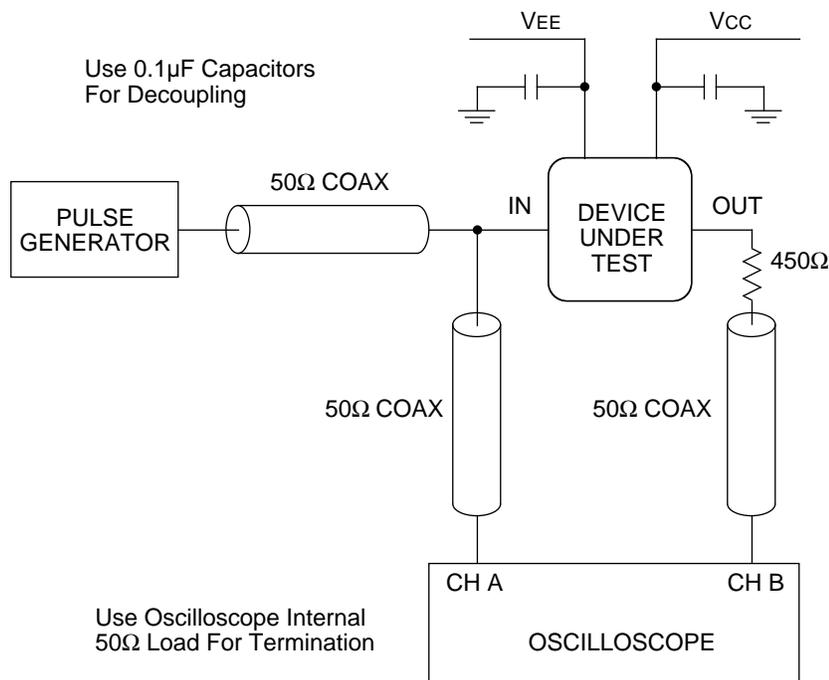
VCC = 4.5V to 5.5V; VEE = -4.2V to -5.5V

| Symbol | Parameter | TA = -40°C | | | TA = 0°C | | | TA = +25°C | | | TA = +85°C | | | Unit |
|------------------|---|----------------------|------|-------|----------------------|------|-------|----------------------|------|-------|----------------------|------|-------|------|
| | | Min. | Typ. | Max. | |
| I _{IH} | Input HIGH Current | — | — | 150 | — | — | 150 | — | — | 150 | — | — | 150 | μA |
| I _{IL} | Input HIGH Current | 0.5 | — | — | 0.5 | — | — | 0.5 | — | — | 0.5 | — | — | μA |
| V _{CMR} | Common Mode Range | V _{EE} +2.2 | — | GND | V |
| V _{PP} | Minimum Peak-to-Peak Input ⁽¹⁾ | 200 | — | — | 200 | — | — | 200 | — | — | 200 | — | — | mV |
| V _{IH} | Input HIGH Voltage | -1165 | — | -880 | -1165 | — | -880 | -1165 | — | -880 | -1165 | — | -880 | mV |
| V _{IL} | Input LOW Voltage | -1810 | — | -1475 | -1810 | — | -1475 | -1810 | — | -1475 | -1810 | — | -1475 | mV |
| V _{BB} | Reference Output | -1.38 | — | -1.26 | -1.38 | — | -1.26 | -1.38 | — | -1.26 | -1.38 | — | -1.26 | mV |

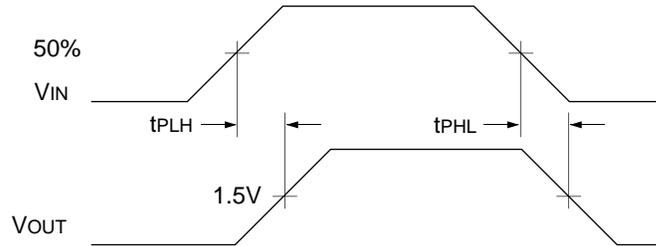
NOTE:

1. 200mV input guarantees full logic at output.

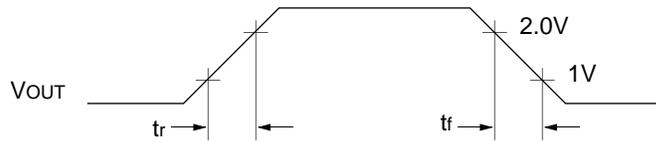
TTL SWITCHING CIRCUIT



ECL/TTL PROPAGATION DELAY — SINGLE ENDED



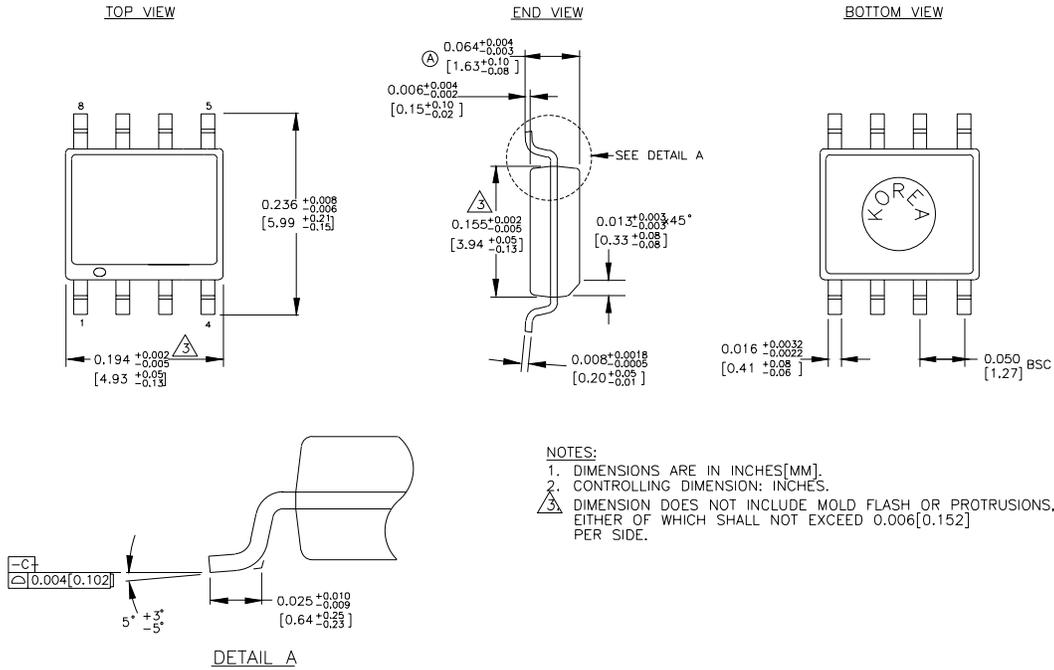
ECL/TTL WAVEFORMS: RISE AND FALL TIMES



PRODUCT ORDERING CODE

| Ordering Code | Package Type | Operating Range |
|----------------|--------------|-----------------|
| SY100ELT25ZC | Z8-1 | Commercial |
| SY100ELT25ZCTR | Z8-1 | Commercial |

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



Rev. 03