



# 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

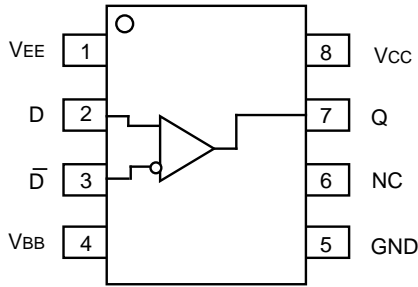
The SY100ELT25 is a differential ECL-to-TTL translator. Because ECL levels are used, a +5V, -5.2V (or -4.5V) and ground are required. The small outline 8-lead SOIC package and the single gate of the ELT25 makes it ideal for those applications where performance, space and low power are at a premium.

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 $\mu$ F capacitor.

## PIN NAMES

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

**PACKAGE/ORDERING INFORMATION**



**8-Pin SOIC (Z8-1)**

**Ordering Information<sup>(1)</sup>**

Part Number	Package Type	Operating Range	Package Marking	Lead Finish
SY100ELT25ZC	Z8-1	Commercial	XEL25	Sn-Pb
SY100ELT25ZCTR <sup>(2)</sup>	Z8-1	Commercial	XEL25	Sn-Pb
SY100ELT25ZI	Z8-1	Industrial	XEL25	Sn-Pb
SY100ELT25ZITR <sup>(2)</sup>	Z8-1	Industrial	XEL25	Sn-Pb
SY100ELT25ZG <sup>(3)</sup>	Z8-1	Industrial	XEL25 with Pb-Free bar-line indicator	Pb-Free NiPdAu
SY100ELT25ZGTR <sup>(2, 3)</sup>	Z8-1	Industrial	XEL25 with with Pb-Free bar-line indicator	Pb-Free NiPdAu

**Notes:**

1. Contact factory for die availability. Dice are guaranteed at  $T_A = 25^\circ\text{C}$ , DC Electricals only.
2. Tape and Reel.
3. Pb-Free package is recommended for new designs.

**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>IN</sub>	ECL Input Voltage	V <sub>EE</sub> to GND+0.5	V
V <sub>OUT</sub>	Voltage Applied to Output at HIGH State	-0.5 to +5.5	V
I <sub>OUT</sub>	Current Applied to Output at LOW State	Twice the Rated I <sub>OL</sub>	mA
T <sub>LEAD</sub>	Lead Temperature (soldering, 20sec.)	+260	°C
T <sub>store</sub>	Storage Temperature	-65 to +150	°C
T <sub>A</sub>	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 CHARACTERISTICS**V<sub>CC</sub> = 4.5V to 5.5V; V<sub>EE</sub> = -4.2V to -5.5V

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	—	14	—	14	9	14	—	14	mA	—
I <sub>EE</sub>	Power Supply Current	—	14	—	14	5.5	14	—	14	mA	—

**AC ELECTRICAL CHARACTERISTICS**V<sub>CC</sub> = 4.5V to 5.5V; V<sub>EE</sub> = -4.2V to -5.5V

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> t <sub>PHL</sub>	Propagation Delay D to Output Q	1.7	3.6	1.7	3.6	1.7	3.6	1.7	3.6	ns	CL = 20pF
f <sub>MAX</sub>	Maximum Frequency	150	—	150	—	150	—	150	—	MHz	CL = 20pF
t <sub>r</sub> t <sub>f</sub>	Output Rise/Fall Time (1.0V to 2.0V)	—	1.5	—	1.5	—	1.5	—	1.5	ns	CL = 20pF

**TTL DC ELECTRICAL CHARACTERISTICS**V<sub>CC</sub> = 4.5V to 5.5V; V<sub>EE</sub> = -4.2V to -5.5V

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	2.4	—	2.4	—	2.4	—	2.4	—	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>OS</sub>	Output Short Circuit Current	-60	-200	-60	-200	-60	-200	-60	-200	mA	V <sub>OUT</sub> = 0V

## ECL DC ELECTRICAL CHARACTERISTICS

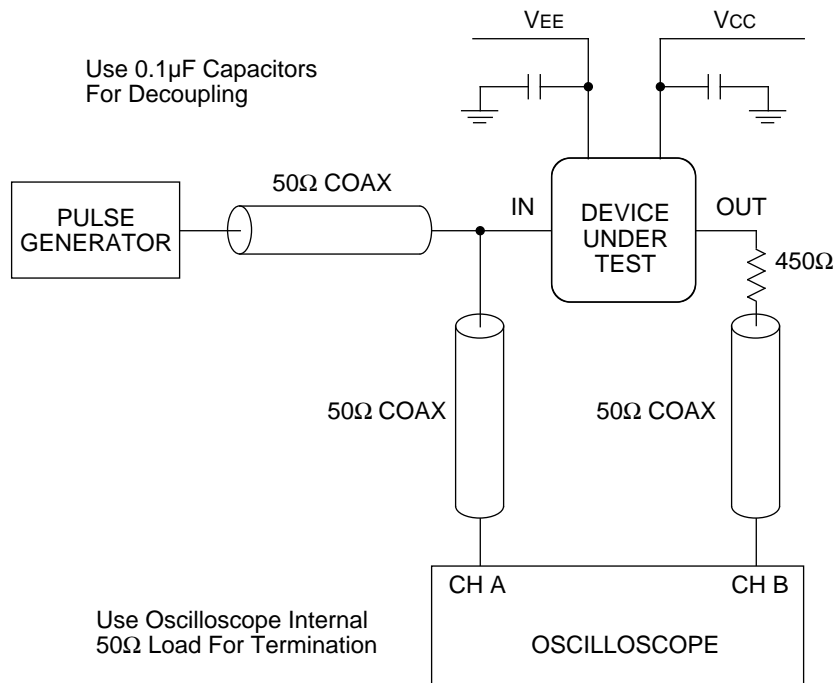
VCC = 4.5V to 5.5V; VEE = -4.2V to -5.5V

Symbol	Parameter	TA = -40°C			TA = 0°C			TA = +25°C			TA = +85°C			Unit
		Min.	Typ.	Max.	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 HIGH Current	0.5	—	—	0.5	—	—	0.5	—	—	0.5	—	—	μA
V <sub>CMR</sub>	Common Mode Range	V <sub>EE</sub> +2.2	—	GND	V <sub>EE</sub> +2.2	—	GND	V <sub>EE</sub> +2.2	—	GND	V <sub>EE</sub> +2.2	—	GND	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	-1165	—	-880	-1165	—	-880	-1165	—	-880	-1165	—	-880	mV
V <sub>IL</sub>	Input LOW Voltage	-1810	—	-1475	-1810	—	-1475	-1810	—	-1475	-1810	—	-1475	mV
V <sub>BB</sub>	Reference Output	-1.38	—	-1.26	-1.38	—	-1.26	-1.38	—	-1.26	-1.38	—	-1.26	mV

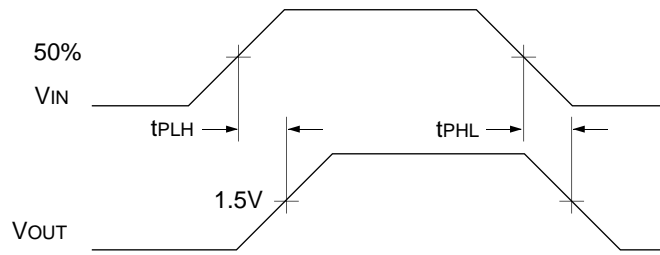
**NOTE:**

1. 200mV input guarantees full logic at output.

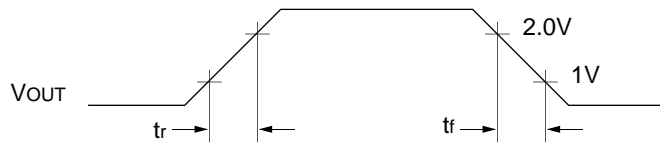
## TTL SWITCHING CIRCUIT



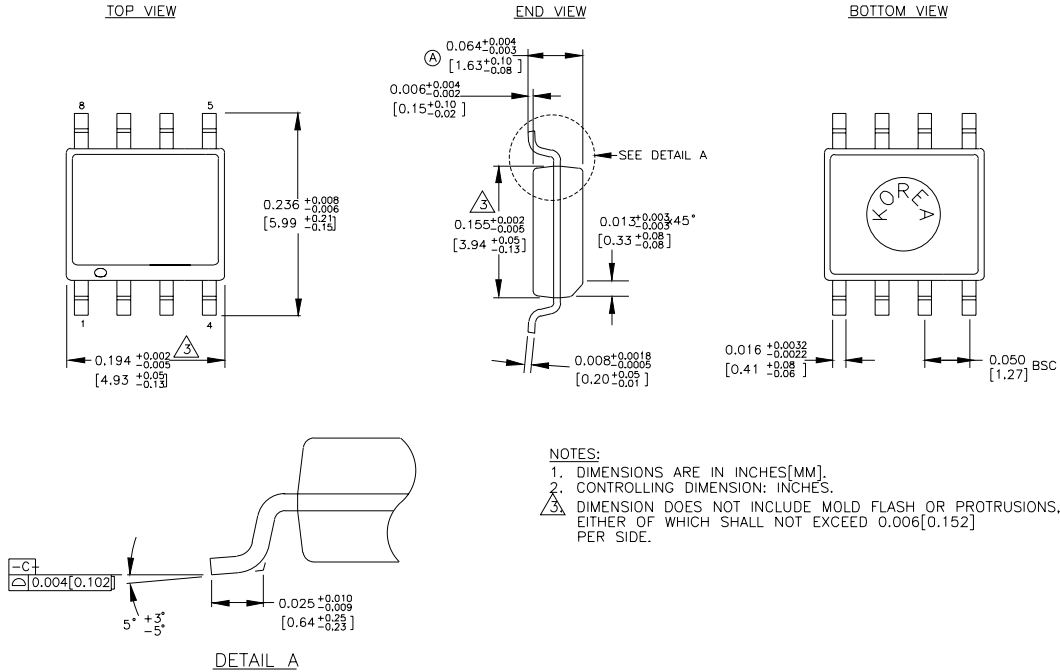
### ECL/TTL PROPAGATION DELAY — SINGLE ENDED



### ECL/TTL WAVEFORMS: RISE AND FALL TIMES



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



Rev. 03

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