



# 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

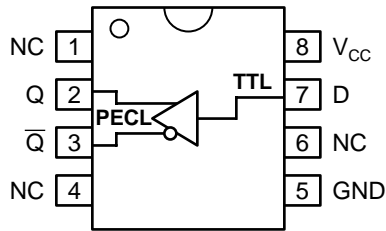
The SY10/100ELT20V is a single TTL-to-differential PECL translator. Because PECL (Positive ECL) levels are used, either +5V or +3.3V and ground are required. The small outline 8-lead SOIC package and low skew single gate design make the ELT20V ideal for applications that require the translation of a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

Pin	Function
Q	Differential PECL Output
D	TTL Input
Vcc	+5V/+3.3V Supply
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
SY10ELT20VZC	Z8-1	Commercial	HEL20V	Sn-Pb
SY10ELT20VZCTR <sup>(2)</sup>	Z8-1	Commercial	HEL20V	Sn-Pb
SY100ELT20VZC	Z8-1	Commercial	XEL20V	Sn-Pb
SY100ELT20VZCTR <sup>(2)</sup>	Z8-1	Commercial	XEL20V	Sn-Pb
SY10ELT20VZI	Z8-1	Industrial	HEL20V	Sn-Pb
SY10ELT20VZITR <sup>(2)</sup>	Z8-1	Industrial	HEL20V	Sn-Pb
SY100ELT20VZI	Z8-1	Industrial	XEL20V	Sn-Pb
SY100ELT20VZITR <sup>(2)</sup>	Z8-1	Industrial	XEL20V	Sn-Pb
SY10ELT20VZG <sup>(3)</sup>	Z8-1	Industrial	HEL20V with Pb-Free bar-line indicator	Pb-Free NiPdAu
SY10ELT20VZGTR <sup>(2, 3)</sup>	Z8-1	Industrial	HEL20V with Pb-Free bar-line indicator	Pb-Free NiPdAu
SY100ELT20VZG <sup>(3)</sup>	Z8-1	Industrial	XEL20V with Pb-Free bar-line indicator	Pb-Free NiPdAu
SY100ELT20VZGTR <sup>(2, 3)</sup>	Z8-1	Industrial	XEL20V with Pb-Free bar-line indicator	Pb-Free NiPdAu

**Notes:**

1. Contact factory for die availability. Dice are guaranteed at T<sub>A</sub> = 25°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>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 -Continuous -Surge	50 100	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	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	—	20 100	—	20 100	—	—	20 100	—	20 100	μA	V <sub>IN</sub> = 2.7V 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>(2)</sup> 10ELT 100ELT	3920	4110	3980	4160	4020	—	4190	4090	4280	mV	
		3915	4120	3975	4120	3975	—	4120	3975	4120		
V <sub>OL</sub>	Output LOW Voltage <sup>(1)</sup> 10ELT 100ELT	3050	3350	3050	3370	3050	—	3370	3050	3405	mV	
		3170	3445	3190	3380	3190	—	3380	3190	3380		

**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 V<sub>CC</sub> = 5.0V. Level Specifications will vary 1:1 with V<sub>CC</sub>.

## AC ELECTRICAL CHARACTERISTICS<sup>(3)</sup>

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.		
t <sub>PLH</sub> t <sub>PHL</sub>	Propagation Delay <sup>(3)</sup>	100	600	100	600	100	—	600	100	600	ps	50Ω to V <sub>CC</sub> - 2.0V
t <sub>skpp</sub>	Part-to-Part Skew <sup>(4)</sup>	—	500	—	500	—	—	500	—	500	ps	50Ω to V <sub>CC</sub> - 2.0V
f <sub>MAX</sub>	Maximum Input Frequency	350	—	350	—	350	—	—	350	—	MHz	50Ω to V <sub>CC</sub> - 2.0V
t <sub>r</sub> t <sub>f</sub>	Output Rise/Fall Time (20% to 80%)	200	500	200	500	200	—	500	200	500	ps	50Ω to V <sub>CC</sub> - 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 V<sub>CC</sub> = 5.0V. Level Specifications will vary 1:1 with V<sub>CC</sub>.

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

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

**TOPOGRAPHY AND PAD COORDINATES**

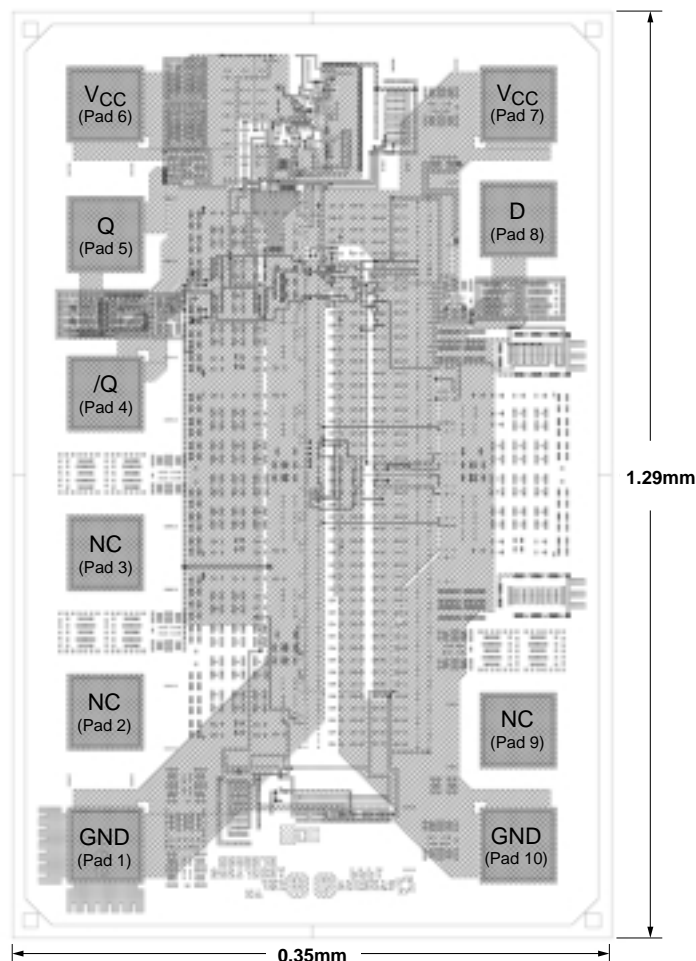


Figure 1. Chip Topography

**PAD COORDINATES TABLE**

Pad Number	Coordinates (µm) <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

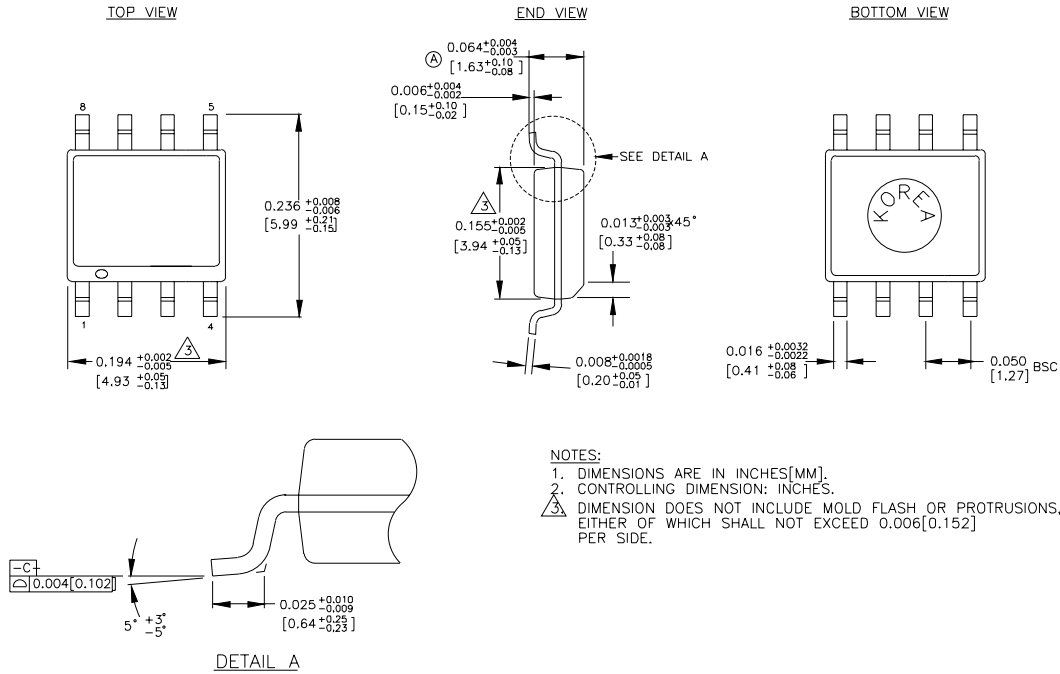
**Notes:**

1. Contact factory for die availability. Dice are guaranteed at T<sub>A</sub> = 25°C, DC Electricals only. Shipped in waffle pack.
2. Recommended for new designs.
3. Tape and Reel.
4. Coordinates reference from the center of the die.

**CHIP INFORMATION**

<b>Transistor Count:</b>	98
<b>Substrate:</b>	Connect to GND
<b>Process:</b>	Bipolar

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



Rev.03

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