



## 3.3V, DUAL DIFFERENTIAL LVPECL-TO-LVTTL TRANSLATOR

Precision Edge®  
SY10ELT23L  
SY100ELT23L

### FEATURES

- 3.3V power supply
- 2.0ns typical propagation delay
- <500ps typical output-to-output skew
- Differential LVPECL inputs
- 24mA LVTTL outputs
- Flow-through pinouts
- Available in 8-pin SOIC package



Precision Edge®

### DESCRIPTION

The SY10/100ELT23L are dual differential LVPECL-to-LVTTL translators with +3.3V power supply. Because LVPECL (Low Voltage Positive ECL) levels are used, only +3.3V and ground are required. The small outline 8-pin SOIC package and the low skew, dual gate design of the ELT23L makes it ideal for applications which require the translation of a clock and a data signal.

The ELT23L 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.

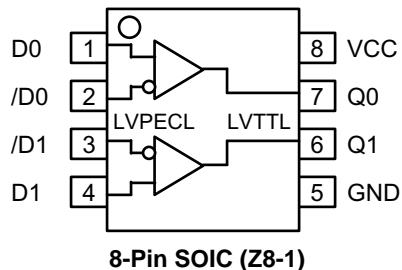
### PIN NAMES

Pin	Function
Qn	LVTTL Outputs
Dn	Differential LVPECL Inputs
VCC	+3.3V Supply
GND	Ground

### TRUTH TABLE

D	/D	Q
L	H	L
H	L	H
Open	Open	L

**PACKAGE/ORDERING INFORMATION<sup>(1)</sup>**



Part Number	Package Type	Operating Range	Package Marking	Lead Finish
SY10ELT23LZC	Z8-1	Commercial	HEL23L	Sn-Pb
SY10ELT23LZCTR <sup>(2)</sup>	Z8-1	Commercial	HEL23L	Sn-Pb
SY100ELT23LZC	Z8-1	Commercial	XEL23L	Sn-Pb
SY100ELT23LZCTR <sup>(2)</sup>	Z8-1	Commercial	XEL23L	Sn-Pb
SY10ELT23LZI	Z8-1	Industrial	HEL23L	Sn-Pb
SY10ELT23LZITR <sup>(2)</sup>	Z8-1	Industrial	HEL23L	Sn-Pb
SY100ELT23LZI	Z8-1	Industrial	XEL23L	Sn-Pb
SY100ELT23LZITR <sup>(2)</sup>	Z8-1	Industrial	XEL23L	Sn-Pb
SY10ELT23LZG <sup>(3)</sup>	Z8-1	Industrial	HEL23L with Pb-Free bar-line indicator	Pb-Free NiPdAu
SY10ELT23LZGTR <sup>(2, 3)</sup>	Z8-1	Industrial	HEL23L with Pb-Free bar-line indicator	Pb-Free NiPdAu
SY100ELT23LZG <sup>(3)</sup>	Z8-1	Industrial	XEL23L with Pb-Free bar-line indicator	Pb-Free NiPdAu
SY100ELT23LZGTR <sup>(2, 3)</sup>	Z8-1	Industrial	XEL23L 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	Rating	Value	Unit
V <sub>CC</sub>	Power Supply Voltage	-0.5 to +3.8	V
V <sub>IN</sub>	PECL Input Voltage	0 to V <sub>CC</sub> +0.5	V
V <sub>OUT</sub>	Voltage Applied to Output at HIGH State	-0.5 to V <sub>CC</sub>	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>S</sub>	Storage Temperature	-65 to +150	°C
T <sub>A</sub>	Operating Temperature Range	-40 to +85	°C

**Notes:**

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.

**LV TTL DC ELECTRICAL CHARACTERISTICS**V<sub>CC</sub> = +3.3V ±5%.

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	2.0	—	2.0	—	2.0	—	2.0	—	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>CC</sub>	Power Supply Current	—	30	—	30	—	30	—	30	mA	
I <sub>OS</sub>	Output Short-Circuit Current	-80	-240	-80	-240	-80	-240	-80	-240	mA	V <sub>OUT</sub> = 0V

**LVPECL DC ELECTRICAL CHARACTERISTICS**V<sub>CC</sub> = +3.3V ±5%.

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.	
I <sub>IH</sub>	Input HIGH Current	—	—	150	—	—	150	—	—	150	—	—	150	μA
I <sub>IL</sub>	Input LOW Current	0.5	—	—	0.5	—	—	0.5	—	—	0.5	—	—	μA
V <sub>CMR</sub>	Common Mode Range	1.5	—	V <sub>CC</sub>	1.5	—	V <sub>CC</sub>	1.5	—	V <sub>CC</sub>	1.5	—	V <sub>CC</sub>	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 <sup>(2)</sup>													mV
	10ELT	2070	—	2410	2130	—	2460	2170	—	2490	2130	—	2565	
	100ELT	2135	—	2420	2135	—	2420	2135	—	2420	2135	—	2420	
V <sub>IL</sub>	Input LOW Voltage <sup>(2)</sup>													mV
	10ELT	1350	—	1800	1350	—	1820	1350	—	1820	1350	—	1820	
	100ELT	1490	—	1825	1490	—	1825	1490	—	1825	1490	—	1825	

**Notes:**

1. 200mV input guaranteed full logic at output.
2. These values are for V<sub>CC</sub> = 3.3V. Level specification will vary 1:1 with V<sub>CC</sub>.

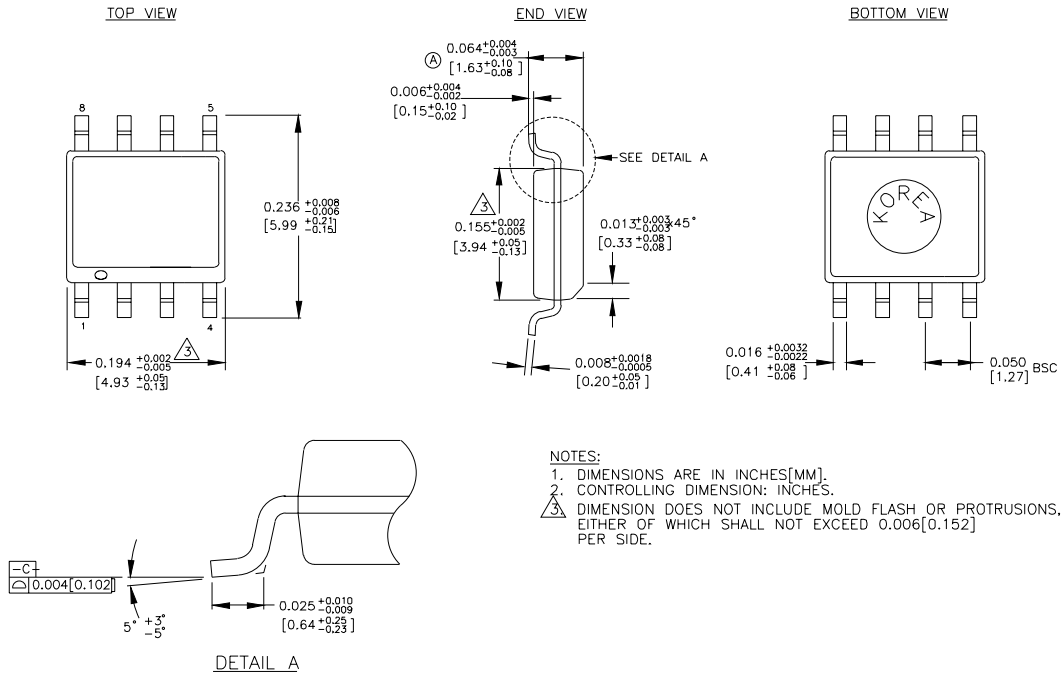
**AC ELECTRICAL CHARACTERISTICS** $V_{CC} = +3.3V \pm 5\%$ .

Symbol	Parameter	$T_A = -40^\circ\text{C}$		$T_A = 0^\circ\text{C}$		$T_A = +25^\circ\text{C}$		$T_A = +85^\circ\text{C}$		Unit	Condition
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.		
$f_{MAX}$	Maximum Input Frequency <sup>(1, 2)</sup>	160	—	160	—	160	—	160	—	MHz	$C_L = 20\text{pF}$
$t_{PD}$	Propagation Delay	1.5	2.5	1.5	2.5	1.5	2.5	1.5	2.5	ns	$C_L = 20\text{pF}$
$t_{skpp}$	Part-to-Part Skew <sup>(3, 6)</sup>	—	0.5	—	0.5	—	0.5	—	0.5	ns	$C_L = 20\text{pF}$
$t_{SKEW++}$	Within-Device Skew <sup>(4, 6)</sup>	—	0.3	—	0.3	—	0.3	—	0.3	ns	$C_L = 20\text{pF}$
$t_{SKEW--}$	Within-Device Skew <sup>(5, 6)</sup>	—	0.3	—	0.3	—	0.3	—	0.3	ns	$C_L = 20\text{pF}$
tr, tf	Output Rise/Fall Times 1.0V to 2.0V	0.5	1.0	0.5	1.0	0.5	1.0	0.5	1.0	ns	$C_L = 20\text{pF}$

**Notes:**

1. Frequency at which output levels will meet a 0.8V to 2.0V minimum swing.
2. The  $f_{MAX}$  value is specified as the minimum guaranteed maximum frequency. Actual operational maximum frequency may be greater.
3. Device-to-Device skew considering HIGH-to-HIGH transitions at common  $V_{CC}$  level.
4. Within-device skew considering HIGH-to-HIGH transitions at common  $V_{CC}$  level.
5. Within-device skew considering LOW-to-LOW transitions at common  $V_{CC}$  level.
6. All skew parameters are guaranteed, but not tested.

**8-PIN SOIC .300" WIDE (Z8-1)**



Rev. 03

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