



**DUAL DIFFERENTIAL  
PECL-to-TTL  
TRANSLATOR**

**Precision Edge®  
SY10ELT23  
SY100ELT23**

**FEATURES**

- 3.0ns typical propagation delay
- <500ps typical output-to-output skew
- Differential PECL inputs
- 24mA TTL outputs
- Flow-through pinouts
- Internal input 50kΩ pulldown resistors
- Available in 8-pin SOIC package



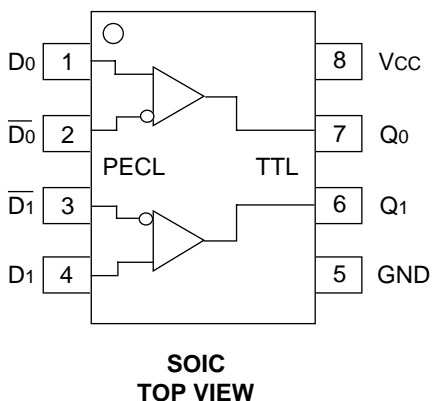
Precision Edge®

**DESCRIPTION**

The SY10/100ELT23 are dual differential PECL-to-TTL translators. Because PECL (Positive ECL) levels are used, only +5V and ground are required. The small outline 8-lead SOIC package and the low skew dual gate design of the ELT23 makes it ideal for applications which require the translation of a clock and a data signal.

The ELT23 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 <sub>n</sub>	TTL Outputs
D <sub>n</sub>	Differential PECL Inputs
V <sub>CC</sub>	+5.0V Supply
GND	Ground

### 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>	PECL Input Voltage	0V to V <sub>CC</sub> +0.5	V
V <sub>O</sub>	Voltage Applied to Output at HIGH State	-0.5 to +5.5	V
I <sub>O</sub>	Current Applied to Output at LOW State	Twice the Rated I <sub>OL</sub>	mA
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<sup>(1)</sup>

V<sub>CC</sub> = V<sub>CC</sub> (Min.) to V<sub>CC</sub> (Max.)

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	—	30	—	30	—	30	—	30	mA	—

**Note:**

- Parametric values specified at: 5 volt Power Supply Range 100ELT23 Series: +4.5V to +5.5V.  
10ELT23 Series +4.75V to +5.5V.

### AC ELECTRICAL CHARACTERISTICS<sup>(1)</sup>

V<sub>CC</sub> = V<sub>CC</sub> (Min.) to V<sub>CC</sub> (Max.)

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	2.5	3.5	2.5	3.5	2.5	3.5	2.5	3.5	ns	CL = 50pF
t <sub>skpp</sub>	Part-to-Part Skew <sup>(2,5)</sup>	—	0.5	—	0.5	—	0.5	—	0.5	ns	CL = 50pF
t <sub>skew++</sub>	Within-Device Skew <sup>(3,5)</sup>	—	0.3	—	0.3	—	0.3	—	0.3	ns	CL = 50pF
t <sub>skew--</sub>	Within-Device Skew <sup>(4,5)</sup>	—	0.3	—	0.3	—	0.3	—	0.3	ns	CL = 50pF
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 = 50pF
f <sub>MAX</sub>	Maximum Input Frequency <sup>(5)</sup>	160	—	160	—	160	—	160	—	MHz	CL = 50pF

**Notes:**

- Parametric values specified at: 5 volt Power Supply Range 100ELT23 Series: +4.5V to +5.5V.  
10ELT23 Series +4.75V to +5.5V.
- Device-to-Device Skew considering HIGH-to-HIGH transitions at common V<sub>CC</sub> level.
- Within-Device Skew considering HIGH-to-HIGH transitions at common V<sub>CC</sub> level.
- Within-Device Skew considering LOW-to-LOW transitions at common V<sub>CC</sub> level.
- These parameters are guaranteed but not tested.

**TTL DC ELECTRICAL CHARACTERISTICS<sup>(1)</sup>**

V<sub>CC</sub> = V<sub>CC</sub> (Min.) to V<sub>CC</sub> (Max.)

Symbol	Parameter	TA = -40°C		TA = 0°C		TA = +25°C		TA = +85°C		Unit	Condition
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.		
VOH	Output HIGH Voltage	2.5	—	2.5	—	2.5	—	2.5	—	V	IOH = -3.0mA IOH = -15mA
		2.0	—	2.0	—	2.0	—	2.0	—	V	
VOL	Output LOW Voltage	—	0.5	—	0.5	—	0.5	—	0.5	V	IOL = 24mA
Ios	Output Short Circuit Current	-80	-200	-80	-200	-80	-200	-80	-200	mA	VOU = 0V

Note:

1. Parametric values specified at: 5 volt Power Supply Range 100ELT23 Series: +4.5V to +5.5V.  
10ELT23 Series +4.75V to +5.5V.

**PECL DC ELECTRICAL CHARACTERISTICS<sup>(1)</sup>**

V<sub>CC</sub> = V<sub>CC</sub> (Min.) to V<sub>CC</sub> (Max.)

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	2.2	—	V <sub>CC</sub>	2.2	—	V <sub>CC</sub>	2.2	—	V <sub>CC</sub>	2.2	—	V <sub>CC</sub>	V	
V <sub>PP</sub>	Minimum Peak-to-Peak Input <sup>(2)</sup>	200	—	—	200	—	—	200	—	—	200	—	—	mV	
V <sub>IH</sub>	Input HIGH Voltage <sup>(3)</sup>													mV	
		10ELT	3770	—	4110	3830	—	4160	3870	—	4190	3940	—		4280
		100ELT	3835	—	4120	3835	—	4120	3835	—	4120	3835	—		4120
V <sub>IL</sub>	Input LOW Voltage <sup>(3)</sup>													mV	
		10ELT	3050	—	3500	3050	—	3520	3050	—	3520	3050	—		3555
		100ELT	3190	—	3525	3190	—	3525	3190	—	3525	3190	—		3525

Notes:

1. Parametric values specified at: 5 volt Power Supply Range 100ELT23 Series: +4.5V to +5.5V.  
10ELT23 Series +4.75V to +5.5V.
2. 200mV input guarantees full logic at output.
3. These values are for V<sub>CC</sub> = 5.0V. Level Specifications will vary 1:1 V<sub>CC</sub>.

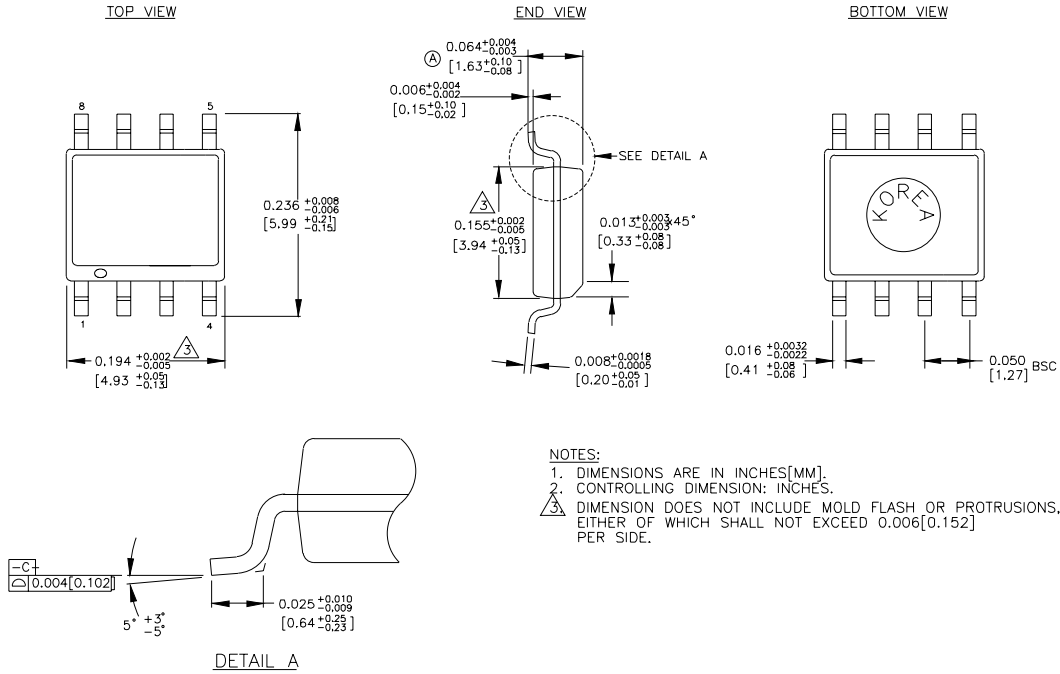
**PRODUCT ORDERING CODE**

Part Number	Package Type	Operating Range	Package Marking	Lead Finish
SY10ELT23ZC	Z8-1	Commercial	HEL23	Standard
SY10ELT23ZCTR <sup>(1)</sup>	Z8-1	Commercial	HEL23	Standard
SY100ELT23ZC	Z8-1	Commercial	XEL23	Standard
SY100ELT23ZCTR <sup>(1)</sup>	Z8-1	Commercial	XEL23	Standard
SY10ELT23ZI	Z8-1	Industrial	HEL23	Standard
SY10ELT23ZITR <sup>(1)</sup>	Z8-1	Industrial	HEL23	Standard
SY100ELT23ZI	Z8-1	Industrial	XEL23	Standard
SY100ELT23ZITR <sup>(1)</sup>	Z8-1	Industrial	XEL23	Standard
SY10ELT23ZG <sup>(2,3)</sup>	Z8-1	Industrial	HEL23	Pb-Free NiPdAu
SY10ELT23ZGTR <sup>(1,2,3)</sup>	Z8-1	Industrial	HEL23	Pb-Free NiPdAu
SY100ELT23ZG <sup>(2,3)</sup>	Z8-1	Industrial	XEL23	Pb-Free NiPdAu
SY100ELT23ZGTR <sup>(1,2,3)</sup>	Z8-1	Industrial	XEL23	Pb-Free NiPdAu

**Notes:**

1. Tape and Reel.
2. Recommended for new designs.
3. Pb-Free version.

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



Rev. 03

**MICREL, INC. 1849 FORTUNE DRIVE SAN JOSE, CA 95131 USA**

TEL + 1 (408) 944-0800 FAX + 1 (408) 944-0970 WEB <http://www.micrel.com>

The information furnished by Micrel in this datasheet is believed to be accurate and reliable. However, no responsibility is assumed by Micrel for its use. Micrel reserves the right to change circuitry and specifications at any time without notification to the customer.

Micrel Products are not designed or authorized for use as components in life support appliances, devices or systems where malfunction of a product can reasonably be expected to result in personal injury. Life support devices or systems are devices or systems that (a) are intended for surgical implant into the body or (b) support or sustain life, and whose failure to perform can be reasonably expected to result in a significant injury to the user. A Purchaser's use or sale of Micrel Products for use in life support appliances, devices or systems is at Purchaser's own risk and Purchaser agrees to fully indemnify Micrel for any damages resulting from such use or sale.