



3.3V DIFFERENTIAL LVPECL-to-LVTTL TRANSLATOR

Precision Edge®
SY10ELT21L
SY100ELT21L

FEATURES

- 3.3V power supply
- 2.0ns typical propagation delay
- Low power
- Differential LVPECL inputs
- 24mA TTL outputs
- Flow-through pinouts
- Available in 8-pin SOIC package



Precision Edge®

DESCRIPTION

The SY10/100ELT21L are single differential LVPECL-to-LVTTL translators using a single +3.3V power supply. Because LVPECL (Low Voltage Positive ECL) levels are used, only +3.3V and ground are required. The small outline 8-lead SOIC package and low skew single gate design make the ELT21L ideal for applications that require the translation of a clock or data signal where minimal space, low power, and low cost are critical.

V_{BB} allows a differential, single-ended, or AC-coupled interface to the device. If used, the V_{BB} output should be bypassed to V_{CC} with 0.01 μ F capacitor.

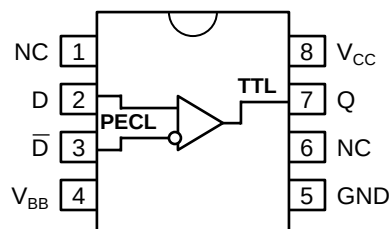
Under open input conditions, the /D will be biased at a $V_{CC}/2$ voltage level and the D input will be pulled to ground. This condition will force the Q output low to provide added stability.

The ELT21L 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	TTL Output
D, /D	Differential LVPECL Inputs
V_{CC}	+3.3V Supply
V_{BB}	Reference Output
GND	Ground

PACKAGE/ORDERING INFORMATION



8-Pin SOIC (Z8-1)

Ordering Information⁽¹⁾

Part Number	Package Type	Operating Range	Package Marking	Lead Finish
SY10ELT21LZC	Z8-1	Commercial	HEL21L	Sn-Pb
SY10ELT21LZCTR ⁽²⁾	Z8-1	Commercial	HEL21L	Sn-Pb
SY100ELT21LZC	Z8-1	Commercial	XEL21L	Sn-Pb
SY100ELT21LZCTR ⁽²⁾	Z8-1	Commercial	XEL21L	Sn-Pb
SY10ELT21LZI	Z8-1	Industrial	HEL21L	Sn-Pb
SY10ELT21LZITR ⁽²⁾	Z8-1	Industrial	HEL21L	Sn-Pb
SY100ELT21LZI	Z8-1	Industrial	XEL21L	Sn-Pb
SY100ELT21LZITR ⁽²⁾	Z8-1	Industrial	XEL21L	Sn-Pb
SY10ELT21LZG ⁽³⁾	Z8-1	Industrial	HEL21L with Pb-Free bar-line indicator	Pb-Free NiPdAu
SY10ELT21LZGTR ^(2, 3)	Z8-1	Industrial	HEL21L with Pb-Free bar-line indicator	Pb-Free NiPdAu
SY100ELT21LZG ⁽³⁾	Z8-1	Industrial	XEL21L with Pb-Free bar-line indicator	Pb-Free NiPdAu
SY100ELT21LZG ^(TR) ^(2, 3)	Z8-1	Industrial	XEL21L 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⁽¹⁾

Symbol	Parameter	Value	Unit
V _{CC}	Power Supply Voltage	−0.5 to +3.8	V
V _I	PECL Input Voltage	0V to V _{CC} +0.5	V
V _O	Voltage Applied to Output at HIGH State	−0.5 to V _{CC}	V
I _O	Current Applied to Output at LOW State	Twice the Rated I _{OL}	mA
T _{LEAD}	Lead Temperature (soldering, 20sec.)	+260	°C
T _{store}	Storage Temperature	−65 to +150	°C
T _A	Operating Temperature	−40 to +85	°C

TRUTH TABLE

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

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.

TTL DC ELECTRICAL CHARACTERISTICS

$$V_{CC} = +3.3V \pm 5\%$$

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.	Typ.	Max.	Min.	Max.		
I _{OS}	Output Short Circuit Current	−80	−275	−80	−275	−80	—	−275	−80	−275	mA	V _{OUT} = 0V
I _{CC}	Power Supply Current	—	20	—	20	—	14	20	—	20	mA	
V _{OH}	Output HIGH Voltage	2.0	—	2.0	—	2.0	—	—	2.0	—	V	I _{OH} = −3.0mA
V _{OL}	Output LOW Voltage	—	0.5	—	0.5	—	—	0.5	—	0.5	V	I _{OL} = 24mA

PECL DC ELECTRICAL CHARACTERISTICS

$$V_{CC} = +3.3V \pm 5\%$$

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.	Typ.	Max.	Min.	Max.		
I _{IH}	Input HIGH Current	—	150	—	150	—	—	150	—	150	μA	
I _{IL}	Input LOW Current	D /D	0.5	—	0.5	—	0.5	—	0.5	—	μA	
			−300	—	−300	—	−300	—	−300	—		
V _{IH}	Input HIGH Voltage ⁽²⁾	10ELT	2070	2410	2130	2460	2170	—	2490	2240	mV	
		100ELT	2135	2420	2135	2420	2135	—	2420	2135		
V _{IL}	Input LOW Voltage ⁽²⁾	10ELT	1350	1800	1350	1820	1350	—	1820	1350	mV	
		100ELT	1490	1825	1490	1825	1490	—	1825	1490		
V _{BB}	Reference Output ⁽²⁾	10ELT	1870	2000	1920	2030	1950	2000	2050	1990	mV	
		100ELT	1920	2040	1920	2040	1920	1980	2040	1920		

NOTES:

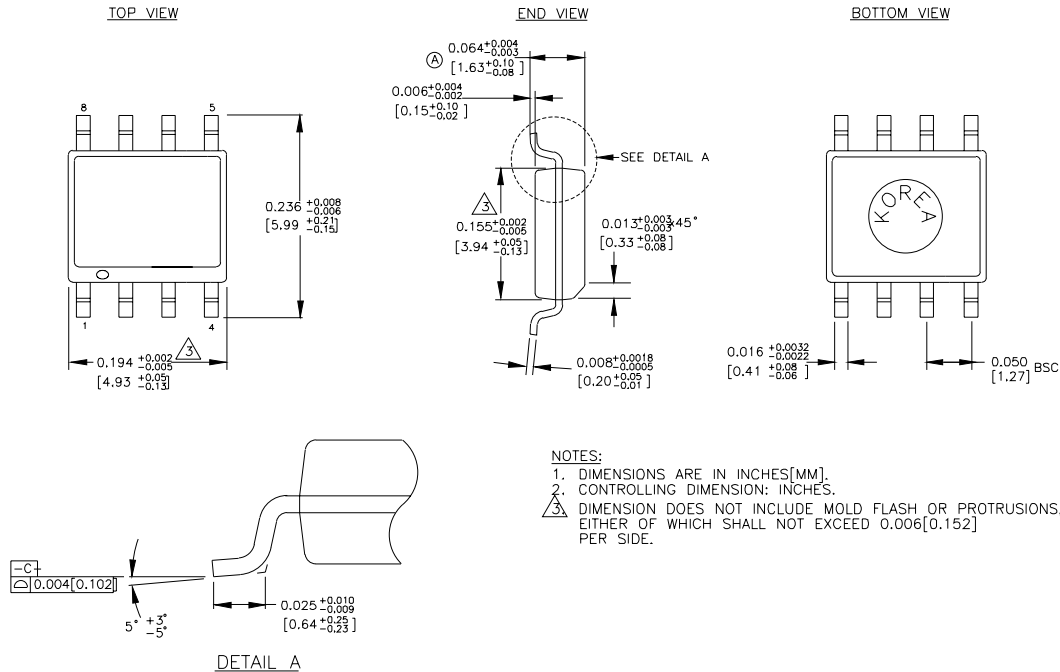
1. These values are for V_{CC} = 3.3V. Level Specifications will vary 1:1 V_{CC}.

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

Symbol	Parameter	TA = -40°C		TA = 0°C		TA = +25°C			TA = +85°C		Unit	Condition
		Min.	Max.	Min.	Max.	Min.	Typ.	Max.	Min.	Max.		
t _{PLH} t _{PHL}	Propagation Delay	1.5	2.5	1.5	2.5	1.5	2.0	2.5	1.5	2.5	ns	C _L = 20pF
t _{skpp}	Part-to-Part Skew ^(1,2)	—	0.5	—	0.5	—	—	0.5	—	0.5	ns	C _L = 20pF
f _{MAX}	Maximum Input Frequency ^(2,3,4)	275	—	275	—	275	—	—	275	—	MHz	C _L = 20pF
V _{CMR}	Common Mode Range	1.2	V _{CC}	1.2	V _{CC}	1.2	—	V _{CC}	1.2	V _{CC}	V	
V _{PP}	Minimum Peak-to-Peak Input ⁽⁵⁾	100	—	100	—	100	—	—	100	—	mV	
t _r t _f	Output Rise/Fall Time (1.0V to 2.0V)	0.5	1.0	0.5	1.0	0.5	—	1.0	0.5	1.0	ns	C _L = 20pF

NOTES:

1. Part-to-Part Skew considering HIGH-to-HIGH transitions at common V_{CC} level.
2. These parameters are guaranteed but not tested.
3. Frequency at which output levels will meet a 0.8V to 2.0V minimum swing.
4. The f_{MAX} value is specified as the minimum guaranteed maximum frequency. Actual operational maximum frequency may be greater.
5. 100mV input guarantees full logic at output.

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

Rev. 03

MICREL, INC. 2180 FORTUNE DRIVE SAN JOSE, CA 95131 USATEL + 1 (408) 944-0800 FAX + 1 (408) 474-1000 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.

© 2006 Micrel, Incorporated.