

SY100EPT21L

3.3V Differential ECL LVPECL-to-LVTTL Translator

ECL Pro™

General Description

The SY100EPT21L is a single, differential LVPECL-to-LVTTL translator using a single +3.3V power supply. Because the device uses low-voltage positive ECL (LVPECL) levels, only +3.3V and ground are required. The small-outline 8-pin SOIC package and low-skew, singlegate design make the EPT21L 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 $0.01\mu F$ capacitor.

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

The 100EPT is compatible with positive ECL 100K logic levels. For applications that require the smallest footprint, consider the SY89321L in ultra-small 8-pin MSOP and SOIC packages.

Data sheets and support documentation can be found on Micrel's web site at: www.micrel.com.



ECL Pro™

Features

- Guaranteed over the industrial temperature range: -40°C to +85°C
- Pin-for-pin, plug-in replacement to MC100EPT21D/DT
- 3.3V power supply
- 1.9ns typical propagation delay
- 275MHz f_{MAX} (clock)
- Differential LVPECL inputs
- 24mA LVTTL output
- Flow-through pin configuration
- · Q output defaults LOW with inputs open
- V_{BB} output
- Available in 8-pin MSOP and SOIC packages

Applications

- ASIC/FPGA interface
- · Legacy interface
- Precision differential-to-general purpose, single-ended translation

Cross Reference

Micrel	ON Semiconductor
SY100EPT21LZI	MC100EPT21D
SY100EPT21LZITR	MC100EPT21DR2
SY100EPT21LKI	MC100EPT21DT
SY100EPT21LKITR	MC100EPT21DTR2

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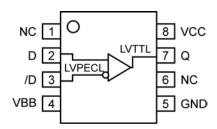
Ordering Information⁽¹⁾

Part Number	Part Number Package		Marking
SY100EPT21LZG ⁽²⁾	8-Pin SOIC (Z8-1)	Industrial	XEP21L with Pb-Free bar-line indicator
SY100EPT21LZGTR ^(2, 3)	8-Pin SOIC (Z8-1)	Industrial	XEP21L with Pb-Free bar-line indicator
SY100EPT21LKG ⁽²⁾	8-Pin MSOP (K8-1)	Industrial	XP21 with Pb-Free bar-line indicator
SY100EPT21LKGTR ^(2, 3)	8-Pin MSOP (K8-1)	Industrial	XP21 with Pb-Free bar-line indicator

Notes:

- 1. Contact factory for die availability. Dice are guaranteed at $T_A = 25$ °C, DC Electricals only.
- 2. Pb-Free packages are recommended for new designs.
- 3. Tape and Reel.

Pin Configuration



8-Pin SOIC (Z8-1) 8-Pin MSOP (K8-1)

Pin Description

Pin Number	Pin Name	Pin Function
1	NC	No Connect
2, 3	D, /D	Differential LVPECL Input Pair
4	VBB	Output Reference Voltage
5	GND	Ground
6	NC	No Connect
7	Q	LVTTL Output
8	VCC	Positive Supply

Truth Table

D	/D	Q
L	Н	L
Н	L	Н
Open	Open	L

Absolute Maximum Ratings(1)

Power Supply Voltage (Vcc)	0.5V to +3.8V
PECL Input Voltage (VIN)	
Voltage Applied to Output at HIGH	State (Vout) -0.5 to Vcc
Current Applied to Output at LOW	State (I _{OUT})
	Twice the Rated IoL (mA)
Lead Temperature (soldering, 20se	ec.)+260°Ć
Storage Temperature (Ts)	65°C to +150°C

Operating Ratings⁽²⁾

–0.5V to +3.8V
40°C to +85°C
113°C/W
124°C/W

LVTTL Output DC Electrical Characteristics

 $V_{CC} = +3.3V$, GND = 0V; $T_A = -40$ °C to +85°C; unless noted.

Symbol	Parameter	Condition	Min.	Тур.	Max.	Units
los	Output Short Circuit Current	Vout = 0V	-80		-275	mA
Icc	Power Supply Current			14	20	mA
Vон	Output High Voltage	$I_{OH} = -3.0 \text{mA}^{(3)}$	2.3			V
V _{OL}	Output Low Voltage	$I_{OL} = 24mA$			0.5	V

LVTTL Input DC Electrical Characteristics

 $V_{CC} = +3.3V$, GND = 0V; $T_A = -40$ °C to +85°C; unless noted.

Symbol	Parameter		Condition	Min.	Тур.	Max.	Units
Іін	Input HIGH Current	•				150	μA
I _{IL}	Input LOW Current	D		0.5			μΑ
		/D		-300			μA
VIH	Input HIGH Voltage		Note 3	2135		2420	mV
V _{IL}	Input LOW Voltage		Note 3	1490		1825	mV
V_{BB}	Reference Output		Note 3	1920	1980	2040	mV

Notes:

Permanent device damage may occur if ratings in the absolute maximum ratings section are exceeded. This is a stress rating only and functional
operation is not implied for conditions other than those detailed in the operational sections of this data sheet. Exposure to absolute maximum
ratings conditions for extended periods may affect device reliability.

^{2.} The data sheet limits are not guaranteed if the device is operated beyond the operating ratings.

^{3.} These values are for V_{CC} = 3.3V. Level Specifications will vary 1:1 V_{CC} .

AC Electrical Characteristics

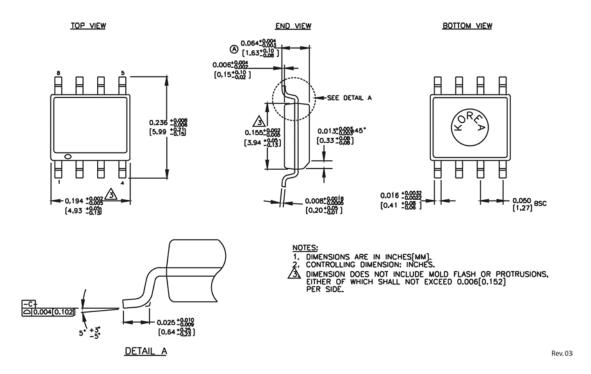
 V_{CC} = +3.0V to +3.6V, GND = 0V; T_A = -40°C to +85°C; unless noted.

Symbol	Parameter	Condition	Min.	Тур.	Max.	Units
t _{PD}	Propagation Delay	C _L = 20pF	1.5	1.9	2.5	ns
t _{skpp}	Part-to-Part Skew	$C_L = 20pF^{(1, 2)}$			0.5	ns
f _{MAX}	Maximum Input Frequency		275			MHz
V _{CMR}	Common Mode Range		1.2		Vcc	V
V _{PP}	Minimum Peak-to-Peak Input	Note 4	100			mV
tr, tf	Output Rise/Fall Time (1.0V to 2.0V)	C _L = 20pF	0.5		1.0	ns

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. The f_{MAX} value is specified as the minimum guaranteed maximum frequency. Actual operational maximum frequency may be greater.
- 4. 100mV input guarantees full logic at output.

Package Information⁽¹⁾

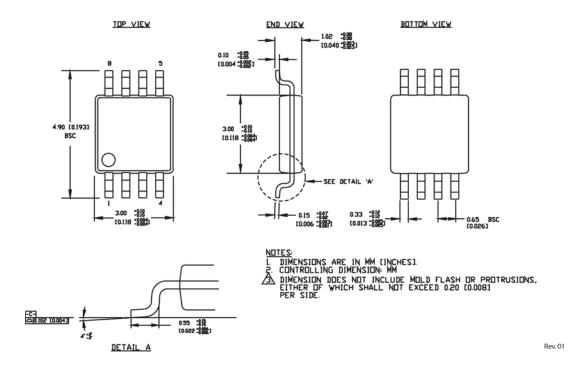


8-Pin Plastic SOIC (Z8-1)

Note:

1. Package information is correct as of the publication date. For updates and most current information, go to www.micrel.com.

Package Information (Continued)



8-Pin MSOP (K8-1)

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