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 pinout
- Q output will default 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

ECL Pro™

DESCRIPTION

The SY100EPT21L is a single, differential LVPECL-to-LVTTL translator using a single +3.3V power supply. Because low voltage positive ECL (LVPECL) levels are used, only +3.3V and ground are required. The small outline 8-pin SOIC package and low-skew, single-gate 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 0.01μF 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.

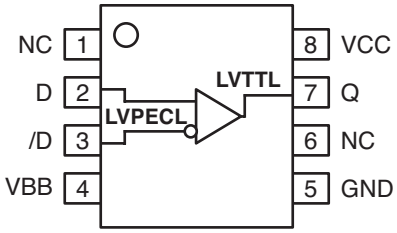
The 100EPT is compatible with positive ECL 100K logic levels. For applications that require the smallest footprint, consider the SY89321L in an ultra-small (2mm × 2mm) 8-pin MLF™ package.

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

CROSS REFERENCE TABLE

Micrel	ON Semiconductor
SY100EPT21LZI	MC100EPT21D
SY100EPT21LZITR	MC100EPT21DR2
SY100EPT21LKI	MC100EPT21DT
SY100EPT21LKITR	MC100EPT21DTR2

PACKAGE/ORDERING INFORMATION



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

Ordering Information[1]

Part Number	Package Type	Operating Range	Package Marking	Lead Finish
SY100EPT21LZC	Z8-1	Commercial	XEP21L	Sn-Pb
SY100EPT21LZCTR[2]	Z8-1	Commercial	XEP21L	Sn-Pb
SY100EPT21LKC	K8-1	Commercial	XP21	Sn-Pb
SY100EPT21LKCTR[2]	K8-1	Commercial	XP21	Sn-Pb
SY100EPT21LZI	Z8-1	Industrial	XEP21L	Sn-Pb
SY100EPT21LZITR[2]	Z8-1	Industrial	XEP21L	Sn-Pb
SY100EPT21LKI	K8-1	Industrial	XP21	Sn-Pb
SY100EPT21LKITR[2]	K8-1	Industrial	XP21	Sn-Pb
SY100EPT21LZG[3]	Z8-1	Industrial	XEP21L with Pb-Free bar-line indicator	Pb-Free NiPdAu
SY100EPT21LZGTR[2, 3]	Z8-1	Industrial	XEP21L with Pb-Free bar-line indicator	Pb-Free NiPdAu
SY100EPT21LKG[3]	K8-1	Industrial	XP21 with Pb-Free bar-line indicator	Pb-Free NiPdAu
SY100EPT21LKGTR[2, 3]	K8-1	Industrial	XP21 with Pb-Free bar-line indicator	Pb-Free NiPdAu

Notes:

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

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	H	L
H	L	H
Open	Open	L

Absolute Maximum Ratings[1]

Power Supply Voltage (V_{CC}) ..... –0.5 to +3.8V
PECL Input Voltage (V_{IN}) ..... 0V to V_{CC} +0.5V
Voltage Applied to Output at HIGH State (V_{OUT}) –0.5 to V_{CC}
Current Applied to Output at LOW State (I_{OUT})
..... Twice the Rated I_{OL} (mA)
Lead Temperature (soldering, 20 sec.) ..... +260°C
Storage Temperature (T_S) ..... –65°C to +150°C

Operating Ratings[2]

Power Supply Voltage (V_{CC}) ..... –0.5 to +3.8V
Ambient Temperature (T_A) ..... –40°C to +85°C
Package Thermal Resistance
SOIC (θ_{JA}) multi-layer board ..... 113°C/W
MSOP (θ_{JA}) multi-layer board ..... 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	Typ	Max	Units
I_{OS}	Output Short Circuit Current	V_{OUT} = 0V	–80		–275	mA
I_{CC}	Power Supply Current			14	20	mA
V_{OH}	Output HIGH Voltage	I_{OH} = –3.0mA[3]	2.3			V
V_{OL}	Output LOW Voltage	I_{OL} = 24mA			0.5	V

LVPECL INPUT DC ELECTRICAL CHARACTERISTICS

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

Symbol	Parameter		Condition	Min	Typ	Max	Units
I_{IH}	Input HIGH Current					150	µA
I_{IL}	Input LOW Current	D		0.5			µA
		/D		–300			µA
V_{IH}	Input HIGH Voltage		**Note 3**	2135		2420	V
V_{IL}	Input LOW Voltage		**Note 3**	1490		1825	V
V_{BB}	Reference Output		**Note 3**	1920	1980	2040	V

Notes:

1. 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

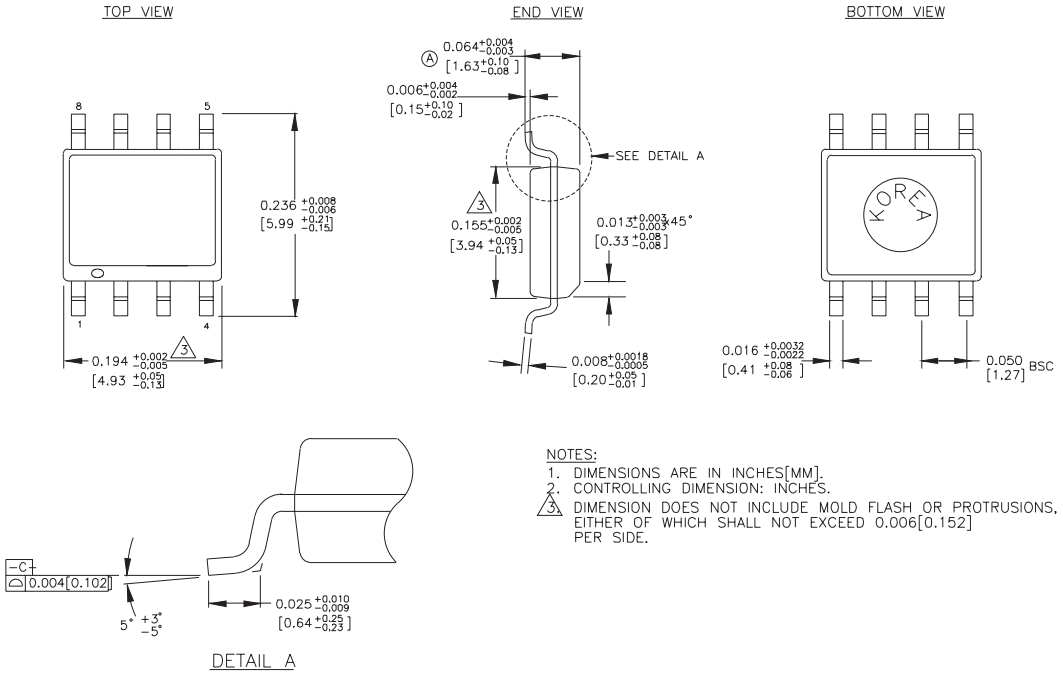
V_{CC} = +3.0V to +3.6V, GND = 0V; T_A = –40°C to +85°C; unless noted.

Symbol	Parameter	Condition	Min	Typ	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[4, 5]			0.5	ns
f_{MAX}	Maximum Input Frequency	C_L = 20pF[6]	275			MHz
V_{CMR}	Common Mode Range		1.2		V_{CC}	V
V_{PP}	Minimum Peak-to-Peak Input	**Note 7**	100			mV
t_r, t_f	Output Rise/Fall Time (1.0V to 2.0V)	C_L = 20pF	0.5		1.0	ns

Notes:

4. Part-to-part skew considering HIGH-to-HIGH transitions at common V_{CC} level.
5. These parameters are guaranteed but not tested.
6. The f_{MAX} value is specified as the minimum guaranteed maximum frequency. Actual operational maximum frequency may be greater.
7. 100mV input guarantees full logic at output.

8-PIN PLASTIC SOIC (Z8-1)



NOTES:
1. DIMENSIONS ARE IN INCHES[MM].
2. CONTROLLING DIMENSION: INCHES.
3. DIMENSION DOES NOT INCLUDE MOLD FLASH OR PROTRUSIONS, EITHER OF WHICH SHALL NOT EXCEED 0.006[0.152] PER SIDE.

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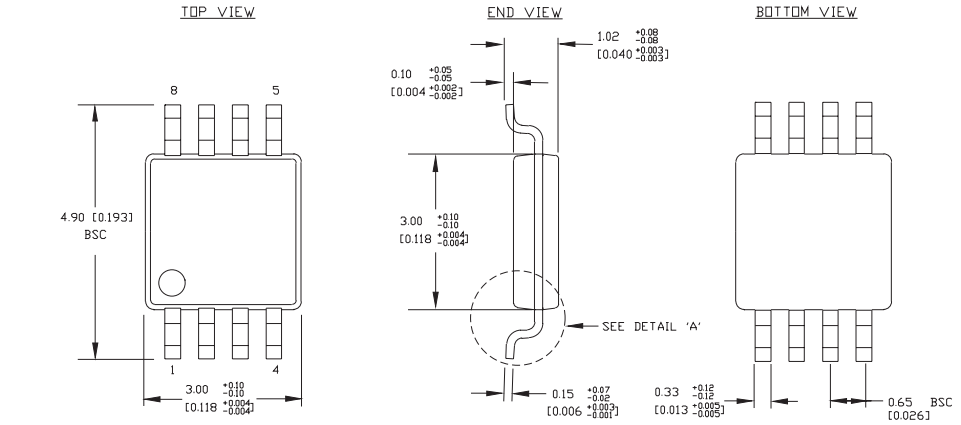
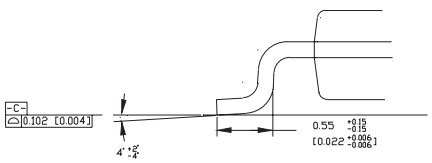
8-PIN MSOP (K8-1)





NOTES:
1. DIMENSIONS ARE IN MM [INCHES].
2. CONTROLLING DIMENSION: MM
3. DIMENSION DOES NOT INCLUDE MOLD FLASH OR PROTRUSIONS, EITHER OF WHICH SHALL NOT EXCEED 0.20 [0.008] PER SIDE.

Rev. 01

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