3.3V/5V DUAL LVTTL/LVCMOS-to-DIFFERENTIAL LVPECL TRANSLATOR

ECL Pro™
SY100EPT22V

FEATURES

- **3.3V and 5V power supply option**
- **300ps typical propagation delay**
- **Differential LVPECL outputs**
- **I_{CC} Max 25mA**
- **PNP LVTTL inputs for minimal loading**
- **Flow-through pinouts**
- **Q outputs will default HIGH with inputs open**
- **Max. frequency range 800MHz**
- **Available in 8-pin MSOP and SOIC package**

ECL Pro™

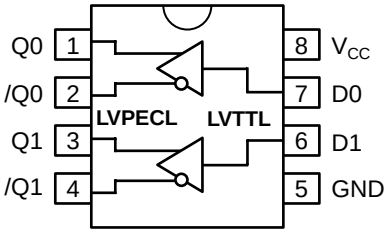
DESCRIPTION

The SY100EPT22V is a dual TTL/CMOS to differential PECL translator. Capable of running from a 3.3 or 5V supply, the part can be used in either LVTTL/LVCMOS/ LVPECL or TTL/CMOS/PECL systems.

The device only requires a single positive supply of 3.3V or 5V - no negative supply is required.

The tiny 8-pin MSOP package and the low skew, dual gate design of the EPT22V makes it ideal for those applications where space, performance, and low power are at a premium.

PIN CONFIGURATION/BLOCK DIAGRAM



(Available in 8-pin SOIC and 8-pin MSOP)

PIN NAMES

Pin	Function
Q_0, $/Q_0$, Q_1, $/Q_1$	Differential LVPECL Outputs
D_0, D_1	LVTTL Inputs
V_{CC}	Positive Supply
GND	Ground

ABSOLUTE MAXIMUM RATINGS(1)

Symbol	Paramter	Value	Unit
V_{CC}	Power Supply Voltage	–0.5 to +7.0	V
V_I	TTL Input Voltage	–0.5 to V_{CC}	V
I_I	TTL Input Current	–30 to +5.0	mA
I_O	PECL Output Current — Continuous — Surge	 50 100	mA
T_{store}	Storage Temperature	–65 to +150	°C
T_A	Operating Temperature	–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.

TRUTH TABLE

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

DC ELECTRICAL CHARACTERISTICS(1)

V_{CC} = +3.3V ±5% or +5.0V ±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.	Max.	Min.	Max.		
I_{CC}	Power Supply Current	—	25	—	25	—	25	—	25	mA	—

Notes:

1. Parametric values specified at: 3 volt Power Supply Range 100EPT22V Series: +3.0V to +3.8V.
   5 volt Power Supply Range 100EPT22V Series: +4.2V to +5.5V.

TTL DC ELECTRICAL CHARACTERISTICS(1)

V_{CC} = +3.3V ±5% or +5.0V ±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.	Max.	Min.	Max.		
V_{IH}	Input HIGH Voltage	2.0	—	2.0	—	2.0	—	2.0	—	V	—
V_{IL}	Input LOW Voltage	—	0.8	—	0.8	—	0.8	—	0.8	V	—
I_{IH}	Input HIGH Current	— —	20 100	— —	20 100	— —	20 100	— —	20 100	µA	V_{IN} = 2.7V V_{IN} = V_{CC}
I_{IL}	Input LOW Current	—	–0.2	—	–0.2	—	–0.2	—	–0.2	mA	V_{IN} = 0.5V
V_{IK}	Input Clamp Voltage	—	–1.2	—	–1.2	—	–1.2	—	–1.2	V	I_{IN} = –18mA

Notes:

1. Parametric values specified at: 3 volt Power Supply Range 100EPT22V Series: +3.0V to +3.8V.
   5 volt Power Supply Range 100EPT22V Series: +4.2V to +5.5V.

PECL DC ELECTRICAL CHARACTERISTICS[1]

V_{CC} = +3.3V ±5% or +5.0V ±5%

Symbol	Parameter	T_A = –40°C			T_A = 0°C			T_A = +25°C			T_A = +85°C			Unit
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
V_{OH}	Output HIGH Voltage[2] 100EPT	2220	—	2420	2275	—	2420	2275	—	2420	2275	—	2420	mV
V_{OL}	Output LOW Voltage[2] 100EPT	1470	—	1750	1490	—	1680	1490	—	1680	1490	—	1680	mV

Notes:

1. Parametric values specified at: 3 volt Power Supply Range 100EPT22V Series: +3.0V to +3.8V.
   5 volt Power Supply Range 100EPT22V Series: +4.2V to +5.5V.
2. These values are for V_{CC} = 3.3V. Level Specifications will vary 1:1 with V_{CC}.

AC ELECTRICAL CHARACTERISTICS[1, 2]

V_{CC} = +3.3V ±5% or +5.0V ±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.	Max.	Min.	Max.		
t_{PLH} t_{PHL}	Propagation Delay to Output D, ENECL/ENTTL	100	600	100	600	100	600	100	600	ps	50Ω to V_{CC} – 2.0V
t_{skpp}	Part-to-Part Skew[2]	—	500	—	500	—	500	—	500	ps	50Ω to V_{CC} – 2.0V
t_{skew}	Within-Device Skew[2, 3]	—	100	—	100	—	100	—	100	ps	50Ω to V_{CC} – 2.0V
t_r t_f	Output Rise/Fall Time 20% to 80%	200	500	200	500	200	500	200	500	ps	50Ω to V_{CC} – 2.0V
f_{MAX}	Maximum Toggle Frequency	—	800	—	800	—	800	—	800	MHz	50Ω to V_{CC} – 2.0V

Notes:

1. Parametric values specified at: 3 volt Power Supply Range 100EPT22V Series: +3.0V to +3.8V.
   5 volt Power Supply Range 100EPT22V Series: +4.2V to +5.5V.
2. Guaranteed, but not tested.
3. Same transition @common V_{CC} levels.

PRODUCT ORDERING CODE

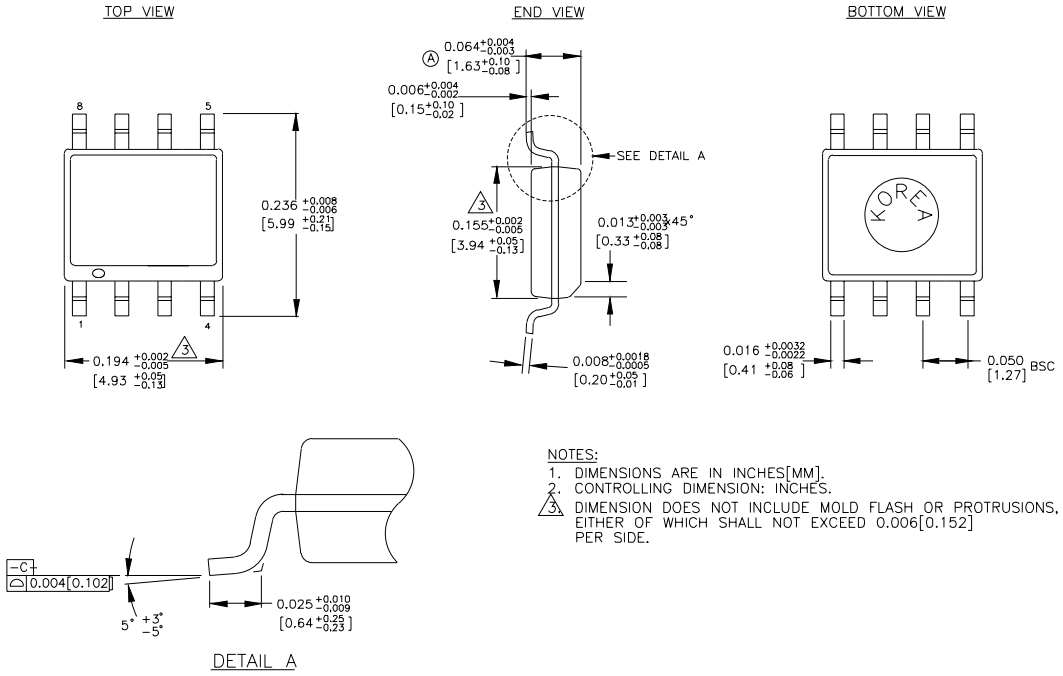
Ordering Code	Package Type	Operating Range	Package Marking
SY100EPT22VZC	Z8-1	Commercial	XEP22V
SY100EPT22VZCTR[1]	Z8-1	Commercial	XEP22V
SY100EPT22VKC	K8-1	Commercial	XP22
SY100EPT22VKCTR[1]	K8-1	Commercial	XP22
SY100EPT22VZZ[3]	Z8-1	Commercial	XEP22V
SY100EPT22VZZTR[1,3]	Z8-1	Commercial	XEP22V
SY100EPT22VKZ[3]	K8-1	Commercial	XP22
SY100EPT22VKZTR[1,3]	K8-1	Commercial	XP22

Ordering Code	Package Type	Operating Range	Package Marking
SY100EPT22VZI[2]	Z8-1	Industrial	XEP22V
SY100EPT22VZITR[1,2]	Z8-1	Industrial	XEP22V
SY100EPT22VKI[2]	K8-1	Industrial	XP22
SY100EPT22VKITR[1,2]	K8-1	Industrial	XP22
SY100EPT22VZY[2,3]	Z8-1	Industrial	XEP22V
SY100EPT22VZYTR[1,2,3]	Z8-1	Industrial	XEP22V
SY100EPT22VKY[2,3]	K8-1	Industrial	XP22
SY100EPT22VKYTR[1,2,3]	K8-1	Industrial	XP22

Notes:

1. Tape and Reel.
2. Recommended for new designs.
3. Pb-Free (lead-free).

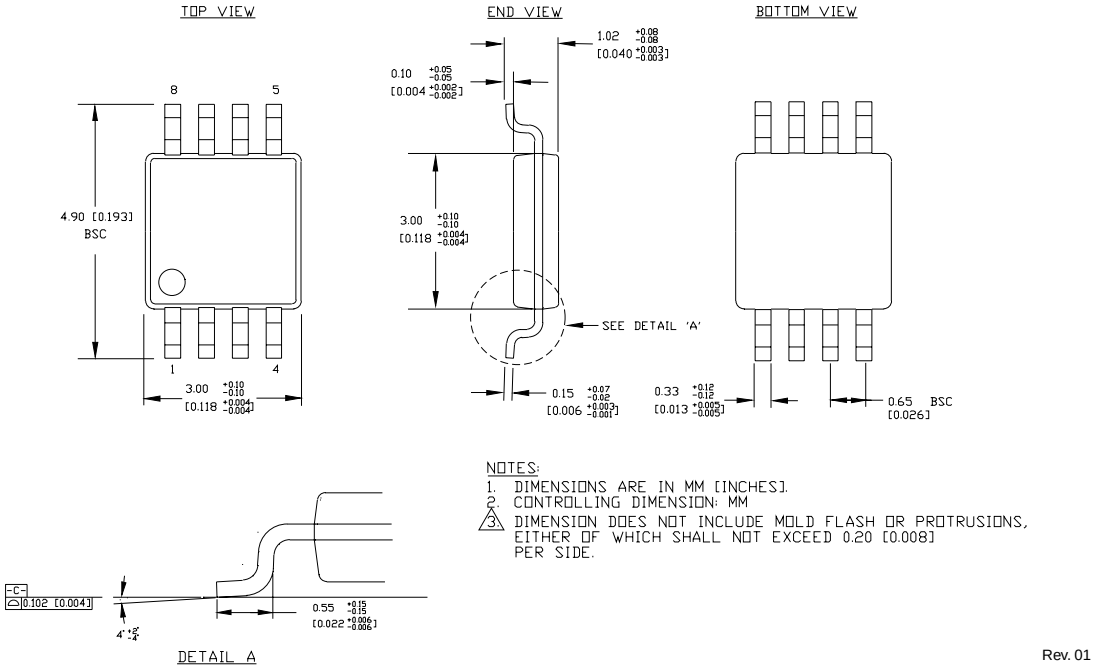
8 LEAD PLASTIC SOIC (Z8-1)



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.

Rev. 03

8 LEAD 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

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

TEL + 1 (408) 944-0800 FAX + 1 (408) 474-1000 WEB http://www.micrel.com