

## FEATURES

- 3.3V and 5V power supply options
- 300ps typical propagation delay
- Differential LVPECL output
- $I_{CC}$  Max 20mA
- PNP LVTTTL input for minimal loading
- Q output will default HIGH with inputs open
- High bandwidth to 800MHz typical
- Available in 8-pin MSOP and SOIC package

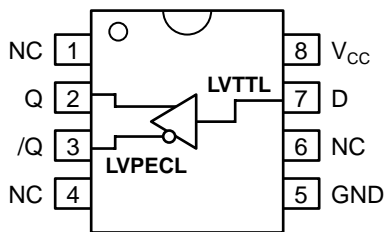
## DESCRIPTION

The SY10/100EPT20V is a TTL/CMOS to differential PECL translator. Capable of running from a 3.3 or 5V supply, the part can be used in either LVTTTL/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 EPT20V 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 or 8-pin MSOP)

## PIN NAMES

Pin	Function
Q, /Q	Differential LVPECL Output
D	LVTTTL Input
$V_{CC}$	Positive 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>	TTL Input Voltage	-0.5 to V <sub>CC</sub>	V
I <sub>I</sub>	TTL Input Current	-30 to +5.0	mA
I <sub>OUT</sub>	PECL Output Current -Continuous -Surge	50 100	mA
T <sub>store</sub>	Storage Temperature	-65 to +150	°C
T <sub>A</sub>	Operating Temperature	-40 to +85	°C

**TRUTH TABLE**

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

**DC ELECTRICAL CHARACTERISTICS**

V<sub>CC</sub> = +3.3V ±10% or +5.0V ±10%

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.	Typ.	Max.	Min.	Max.		
I <sub>CC</sub>	Power Supply Current	—	20	—	20	—	—	20	—	20	mA	—

**TTL DC ELECTRICAL CHARACTERISTICS**

V<sub>CC</sub> = +3.3V ±10% or +5.0V ±10%

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.	Typ.	Max.	Min.	Max.		
V <sub>IH</sub>	Input HIGH Voltage	2.0	—	2.0	—	2.0	—	—	2.0	—	V	—
V <sub>IL</sub>	Input LOW Voltage	—	0.8	—	0.8	—	—	0.8	—	0.8	V	—
I <sub>IH</sub>	Input HIGH Current	—	20	—	20	—	—	20	—	20	µA	V <sub>IN</sub> = 2.7V V <sub>IN</sub> = V <sub>CC</sub>
I <sub>IL</sub>	Input LOW Current	—	-0.2	—	-0.2	—	—	-0.2	—	-0.2	mA	V <sub>IN</sub> = 0.5V
V <sub>IK</sub>	Input Clamp Voltage	—	-1.2	—	-1.2	—	—	-1.2	—	-1.2	V	I <sub>IN</sub> = -18mA

**PECL DC ELECTRICAL CHARACTERISTICS**

V<sub>CC</sub> = +3.3V ±10% or +5.0V ±10%

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.	Typ.	Max.	Min.	Max.		
V <sub>OH</sub>	Output HIGH Voltage <sup>(1)</sup>										mV	
	10EPT	3920	4110	3980	4160	4020	—	4190	4090	4280		
	100EPT	3915	4120	3975	4120	3975	—	4120	3975	4120		
V <sub>OL</sub>	Output LOW Voltage <sup>(1)</sup>										mV	
	10EPT	3050	3350	3050	3370	3050	—	3370	3050	3405		
	100EPT	3170	3445	3190	3380	3190	—	3380	3190	3380		

**NOTES:**

1. These values are for V<sub>CC</sub> = 5.0V. Level Specifications will vary 1:1 with V<sub>CC</sub>.

**AC ELECTRICAL CHARACTERISTICS<sup>(1)</sup>** $V_{CC} = +3.3V \pm 10\%$  or  $+5.0V \pm 10\%$ 

Symbol	Parameter	$T_A = -40^\circ\text{C}$		$T_A = 0^\circ\text{C}$		$T_A = +25^\circ\text{C}$			$T_A = +85^\circ\text{C}$		Unit	Condition
		Min.	Max.	Min.	Max.	Min.	Typ.	Max.	Min.	Max.		
$t_{PLH}$ $t_{PHL}$	Propagation Delay <sup>(1)</sup>	100	600	100	600	100	—	600	100	600	ps	$50\Omega$ to $V_{CC} - 2.0V$
$t_{skpp}$	Part-to-Part Skew <sup>(2)</sup>	—	500	—	500	—	—	500	—	500	ps	$50\Omega$ to $V_{CC} - 2.0V$
$f_{MAX}$	Maximum Input Frequency	350	—	350	—	350	—	—	350	—	MHz	$50\Omega$ to $V_{CC} - 2.0V$
$f_{MAX}$	Maximum Toggle Frequency	—	800	—	800	—	—	800	—	800	MHz	$50\Omega$ 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	$50\Omega$ to $V_{CC} - 2.0V$

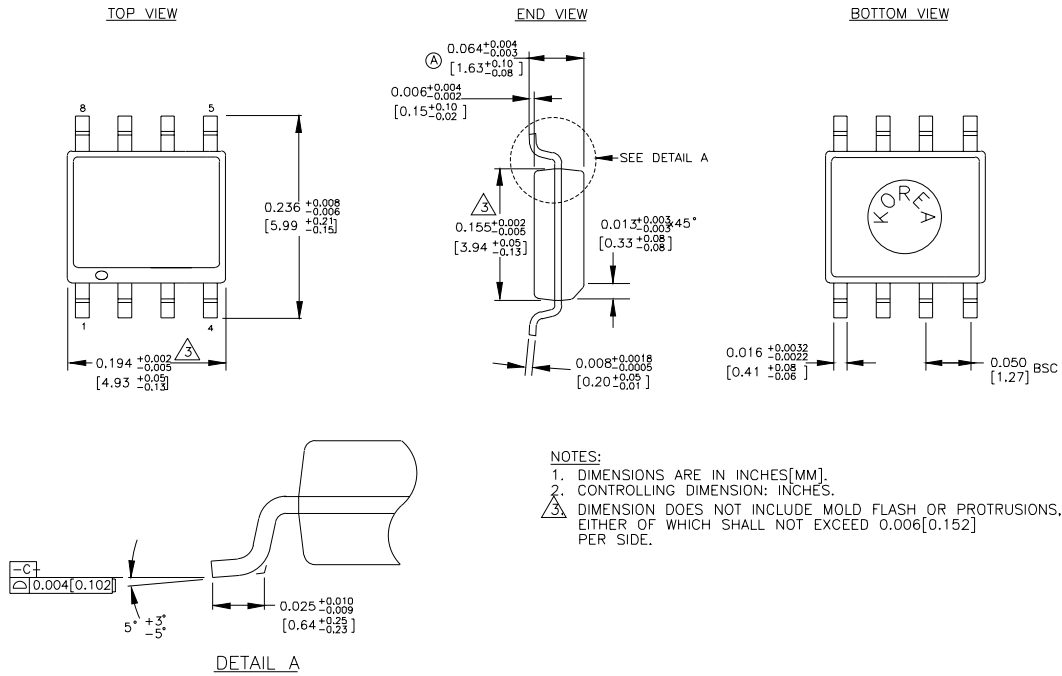
**NOTES:**

1. Input Rise Time < 1.0ns.
2. Guaranteed by design. Not tested in production.

**PRODUCT ORDERING INFORMATION**

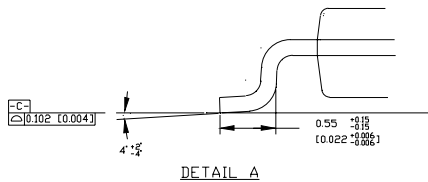
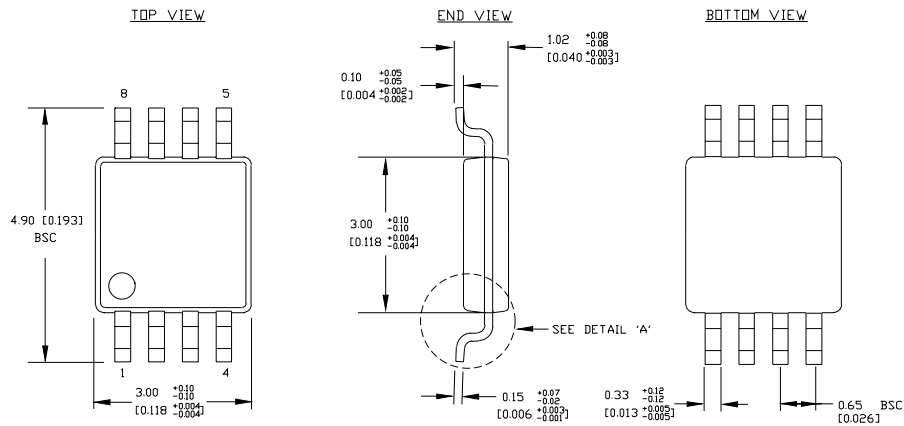
Ordering Code	Package Type	Operating Range	$V_{CC}$ Range (V)
SY10EPT20VZC	Z8-1	Commercial	+3.3V $\pm 5\%$
SY10EPT20VZCTR	Z8-1	Commercial	+3.3V $\pm 5\%$
SY10EPT20VKC	K8-1	Commercial	+3.3V $\pm 5\%$
SY10EPT20VKCTR	K8-1	Commercial	+3.3V $\pm 5\%$
SY100EPT20VZC	Z8-1	Commercial	+3.3V $\pm 5\%$
SY100EPT20VZCTR	Z8-1	Commercial	+3.3V $\pm 5\%$
SY100EPT20VKC	K8-1	Commercial	+3.3V $\pm 5\%$
SY100EPT20VKCTR	K8-1	Commercial	+3.3V $\pm 5\%$

**8 LEAD PLASTIC SOIC (Z8-1)**



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-SYNERGY 3250 SCOTT BOULEVARD SANTA CLARA CA 95054 USA**

TEL + 1 (408) 980-9191 FAX + 1 (408) 914-7878 WEB <http://www.synergysemi.com> <http://www.micrel.com>

This information is believed to be accurate and reliable, however no responsibility is assumed by Micrel for its use nor for any infringement of patents or other rights of third parties resulting from its use. No license is granted by implication or otherwise under any patent or patent right of Micrel Inc.

© 2000 Micrel Incorporated

---