



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

**ECL Pro™
SY10EPT20V
SY100EPT20V**



ECL Pro™

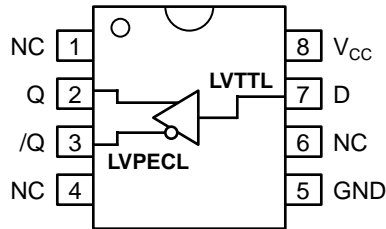
- 3.3V and 5V power supply options
- 300ps typical propagation delay
- Differential LVPECL output
- I_{CC} Max 20mA
- PNP LVTTL input for minimal loading
- Q output will default HIGH with inputs open
- High bandwidth to 800MHz typical
- Available in 8-pin MSOP and SOIC package

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 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 EPT20V makes it ideal for those applications where space, performance, and low power are at a premium.

| Pin | Function |
|-----------------|----------------------------|
| Q, /Q | Differential LVPECL Output |
| D | LVTTL Input |
| V _{CC} | Positive Supply |
| GND | Ground |



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

Ordering Information⁽¹⁾

| Part Number | Package Type | Operating Range | Package Marking | Lead Finish |
|-----------------------------------|--------------|-----------------|---------------------------------------|----------------|
| SY10EPT20VZC | Z8-1 | Commercial | HEP20 | Sn-Pb |
| SY10EPT20VZCTR ⁽²⁾ | Z8-1 | Commercial | HEP20 | Sn-Pb |
| SY100EPT20VZC | Z8-1 | Commercial | XEP20 | Sn-Pb |
| SY100EPT20VZCTR ⁽²⁾ | Z8-1 | Commercial | XEP20 | Sn-Pb |
| SY10EPT20VKC | K8-1 | Commercial | HP20 | Sn-Pb |
| SY10EPT20VKCTR ⁽²⁾ | K8-1 | Commercial | HP20 | Sn-Pb |
| SY100EPT20VKC | K8-1 | Commercial | XP20 | Sn-Pb |
| SY100EPT20VKCTR ⁽²⁾ | K8-1 | Commercial | XP20 | Sn-Pb |
| SY10EPT20VZI | Z8-1 | Industrial | HEP20 | Sn-Pb |
| SY10EPT20VZITR ⁽²⁾ | Z8-1 | Industrial | HEP20 | Sn-Pb |
| SY100EPT20VZI | Z8-1 | Industrial | XEP20 | Sn-Pb |
| SY100EPT20VZITR ⁽²⁾ | Z8-1 | Industrial | XEP20 | Sn-Pb |
| SY10EPT20VKI | K8-1 | Industrial | HP20 | Sn-Pb |
| SY10EPT20VKITR ⁽²⁾ | K8-1 | Industrial | HP20 | Sn-Pb |
| SY100EPT20VKI | K8-1 | Industrial | XP20 | Sn-Pb |
| SY100EPT20VKITR ⁽²⁾ | K8-1 | Industrial | XP20 | Sn-Pb |
| SY10EPT20VZG ⁽³⁾ | Z8-1 | Industrial | HEP20 with Pb-Free bar-line indicator | NiPdAu Pb-Free |
| SY10EPT20VZGTR ^(2, 3) | Z8-1 | Industrial | HEP20 with Pb-Free bar-line indicator | NiPdAu Pb-Free |
| SY100EPT20VZG ⁽³⁾ | Z8-1 | Industrial | XEP20 with Pb-Free bar-line indicator | NiPdAu Pb-Free |
| SY100EPT20VZGTR ^(2, 3) | Z8-1 | Industrial | XEP20 with Pb-Free bar-line indicator | NiPdAu Pb-Free |
| SY10EPT20VKG ⁽³⁾ | K8-1 | Industrial | HP20 with Pb-Free bar-line indicator | NiPdAu Pb-Free |
| SY10EPT20VKGTR ^(2, 3) | K8-1 | Industrial | HP20 with Pb-Free bar-line indicator | NiPdAu Pb-Free |
| SY100EPT20VKG ⁽³⁾ | K8-1 | Industrial | XP20 with Pb-Free bar-line indicator | NiPdAu Pb-Free |
| SY100EPT20VKGTR ^(2, 3) | K8-1 | Industrial | XP20 with Pb-Free bar-line indicator | NiPdAu Pb-Free |

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.

| Symbol | Parameter | Value | Unit |
|--------------------|---|-------------------------|------|
| V _{CC} | Power Supply Voltage | -0.5 to +7.0 | V |
| V _{IN} | TTL Input Voltage | -0.5 to V _{CC} | V |
| I _{IN} | TTL Input Current | -30 to +5.0 | mA |
| I _{OUT} | PECL Output Current | | mA |
| | -Continuous | 50 | |
| | -Surge | 100 | |
| T _{LEAD} | Lead Temperature (Soldering, 20sec.) | +260 | °C |
| T _{store} | Storage Temperature | -65 to +150 | °C |
| T _A | Operating Temperature | -40 to +85 | °C |

| 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.

V_{CC} = +3.3V ±10% or +5.0V ±10%

| 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 _{CC} | Power Supply Current | — | 20 | — | 20 | — | — | 20 | — | 20 | mA | — |

V_{CC} = +3.3V ±10% or +5.0V ±10%

| 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. | | |
| 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 | — | 20 | — | — | 20 | — | 20 | μA | V _{IN} = 2.7V V _{IN} = V _{CC} |
| | | — | 100 | — | 100 | — | — | 100 | — | 100 | | |
| 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 |

V_{CC} = +3.3V ±10% or +5.0V ±10%

| 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. | | |
| V _{OH} | Output HIGH Voltage ⁽¹⁾ | | | | | | | | | | mV | |
| | 10EPT | 3920 | 4110 | 3980 | 4160 | 4020 | — | 4190 | 4090 | 4280 | | |
| | 100EPT | 3915 | 4120 | 3975 | 4120 | 3975 | — | 4120 | 3975 | 4120 | | |
| V _{OL} | Output LOW Voltage ⁽¹⁾ | | | | | | | | | | mV | |
| | 10EPT | 3050 | 3350 | 3050 | 3370 | 3050 | — | 3370 | 3050 | 3405 | | |
| | 100EPT | 3170 | 3445 | 3190 | 3380 | 3190 | — | 3380 | 3190 | 3380 | | |

Note 1. These values are for V_{CC} = 5.0V. Level Specifications will vary 1:1 with V_{CC}.

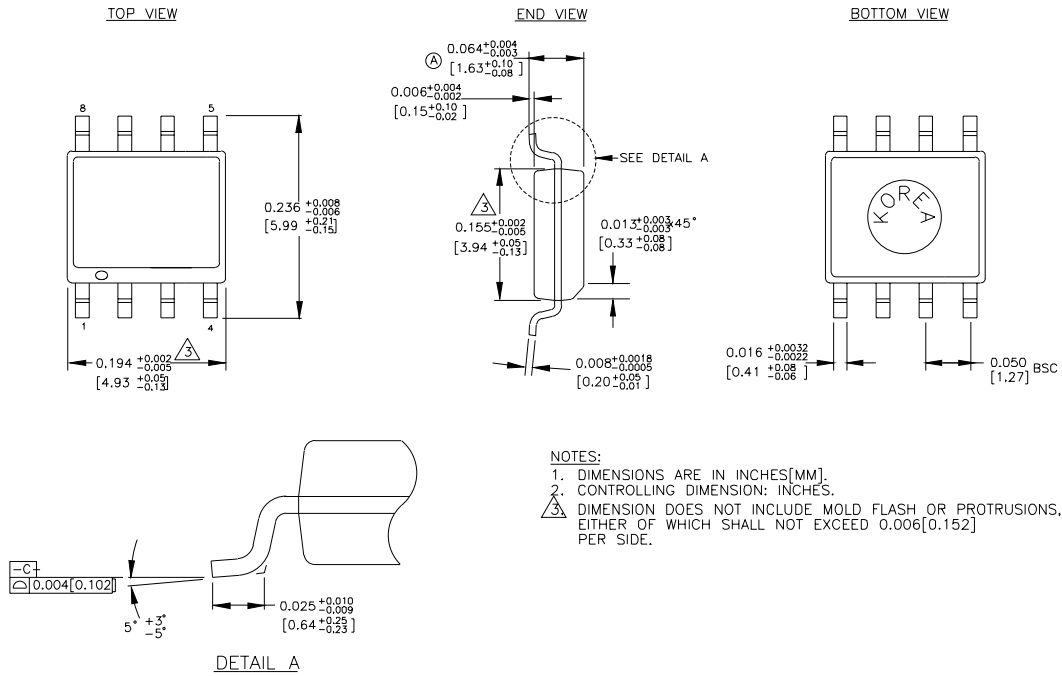
$V_{CC} = +3.3V \pm 10\%$ or $+5.0V \pm 10\%$, $R_L = 50\Omega$ to $V_{CC} - 2V$

| 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 |
|----------------|--|---------------------------|------|-------------------------|------|---------------------------|------|------|---------------------------|------|-------------------|
| | | Min. | Max. | Min. | Max. | Min. | Typ. | Max. | Min. | Max. | |
| t_{PD} | Propagation Delay ⁽¹⁾ | 100 | 600 | 100 | 600 | 100 | — | 600 | 100 | 600 | ps |
| t_{SKEW} | Part-to-Part Skew ⁽²⁾ | — | 500 | — | 500 | — | — | 500 | — | 500 | ps |
| f_{MAX} | Maximum Input Frequency | 850 | — | 850 | — | 850 | — | — | 850 | — | MHz |
| t_{JITTER} | Random Jitter (R_J) ⁽³⁾ | — | 2 | — | 2 | — | 0.9 | 2 | — | 2 | ps _{RMS} |
| t_r t_f | Output Rise/Fall Time (20% to 80%) | 200 | 500 | 200 | 500 | 200 | — | 500 | 200 | 500 | ps |

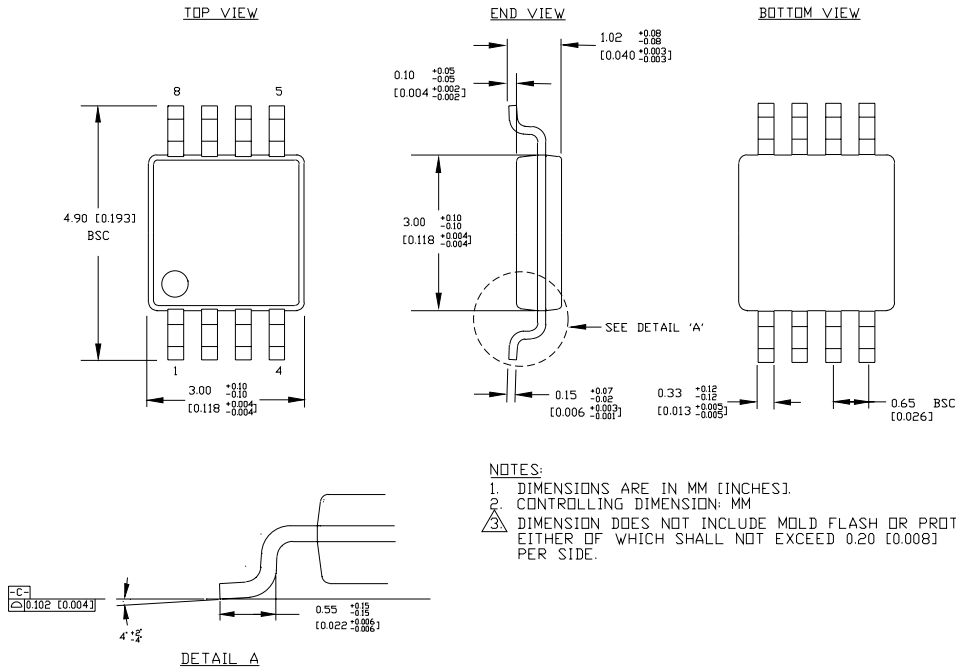
Note 1. Input Rise Time < 1.0ns.

Note 2. Guaranteed by design. Not tested in production.

Note 3. R_J is measured with a K28.7 101010 pattern.



Rev. 03



Rev. 01

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