



**3.3V/5V DUAL  
LVTTTL/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 LVTTTL 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

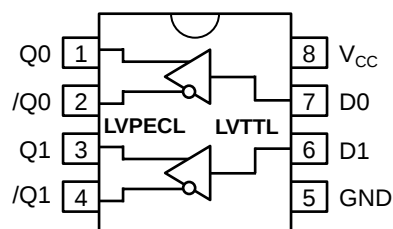
The SY100EPT22V is a dual TTL/CMOS to differential PECL translator. Capable of running from a 3.3 or 5V supply, the part can be used in either LVTTTL/LVCMOS/LVPECL or TTL/CMOS/PECL systems.

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 EPT22V makes it ideal for those applications where space, performance, and low power are at a premium.

## PIN NAMES

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

**PACKAGE/ORDERING INFORMATION**

Available in 8-pin SOIC and  
8-pin MSOP

**Ordering Information<sup>(1)</sup>**

| Part Number                       | Package Type | Operating Range | Package Marking                        | Lead Finish    |
|-----------------------------------|--------------|-----------------|----------------------------------------|----------------|
| SY100EPT22VZC                     | Z8-1         | Commercial      | XEP22V                                 | Sn-Pb          |
| SY100EPT22VZCTR <sup>(2)</sup>    | Z8-1         | Commercial      | XEP22V                                 | Sn-Pb          |
| SY100EPT22VKC                     | K8-1         | Commercial      | XP22                                   | Sn-Pb          |
| SY100EPT22VKCTR <sup>(2)</sup>    | K8-1         | Commercial      | XP22                                   | Sn-Pb          |
| SY100EPT22VKI                     | K8-1         | Industrial      | XP22                                   | Sn-Pb          |
| SY100EPT22VKITR <sup>(2)</sup>    | K8-1         | Industrial      | XP22                                   | Sn-Pb          |
| SY100EPT22VZI                     | Z8-1         | Industrial      | XEP22V                                 | Sn-Pb          |
| SY100EPT22VZITR <sup>(2)</sup>    | Z8-1         | Industrial      | XEP22V                                 | Sn-Pb          |
| SY100EPT22VZG <sup>(3)</sup>      | Z8-1         | Industrial      | XEP22V with Pb-Free bar-line indicator | Pb-Free NiPdAu |
| SY100EPT22VZGTR <sup>(2, 3)</sup> | Z8-1         | Industrial      | XEP22V with Pb-Free bar-line indicator | Pb-Free NiPdAu |
| SY100EPT22VKG <sup>(3)</sup>      | K8-1         | Industrial      | XP22 with Pb-Free bar-line indicator   | Pb-Free NiPdAu |
| SY100EPT22VKGTR <sup>(2, 3)</sup> | K8-1         | Industrial      | XP22 with Pb-Free bar-line indicator   | Pb-Free NiPdAu |

**Notes:**

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

**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>O</sub>     | PECL Output Current                     |                         | mA   |
|                    | — Continuous                            | 50                      |      |
|                    | — Surge                                 | 100                     |      |
| T <sub>LEAD</sub>  | Lead Temperature<br>(Soldering, 20sec.) | +260                    | °C   |
| T <sub>store</sub> | Storage Temperature                     | −65 to +150             | °C   |
| T <sub>A</sub>     | Operating Temperature                   | −40 to +85              | °C   |

**TRUTH TABLE**

| D    | Q | I/Q |
|------|---|-----|
| H    | H | L   |
| L    | L | H   |
| Open | H | L   |

**Notes:**

- 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<sup>(1)</sup>**V<sub>CC</sub> = +3.3V ±5% or +5.0V ±5%

| 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.                   | Max. | Min.                   | Max. |      |           |
| I <sub>CC</sub> | Power Supply Current | —                      | 25   | —                    | 25   | —                      | 25   | —                      | 25   | mA   | —         |

**Notes:**

- 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<sup>(1)</sup>**V<sub>CC</sub> = +3.3V ±5% or +5.0V ±5%

| 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.                   | 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<br>100 | —                    | 20<br>100 | —                      | 20<br>100 | —                      | 20<br>100 | μA   | V <sub>IN</sub> = 2.7V<br>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                                     |

**Notes:**

- 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<sup>(1)</sup>** $V_{CC} = +3.3V \pm 5\%$  or  $+5.0V \pm 5\%$ 

| 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.                      | Typ. | Max. | Min.                    | Typ. | Max. | Min.                      | Typ. | Max. | Min.                      | Typ. | Max. |      |
| $V_{OH}$ | Output HIGH Voltage <sup>(2)</sup><br>100EPT | 2220                      | —    | 2420 | 2275                    | —    | 2420 | 2275                      | —    | 2420 | 2275                      | —    | 2420 | mV   |
| $V_{OL}$ | Output LOW Voltage <sup>(2)</sup><br>100EPT  | 1470                      | —    | 1750 | 1490                    | —    | 1680 | 1490                      | —    | 1680 | 1490                      | —    | 1680 | mV   |

**Notes:**

- 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.
- These values are for  $V_{CC} = 3.3V$ . Level Specifications will vary 1:1 with  $V_{CC}$ .

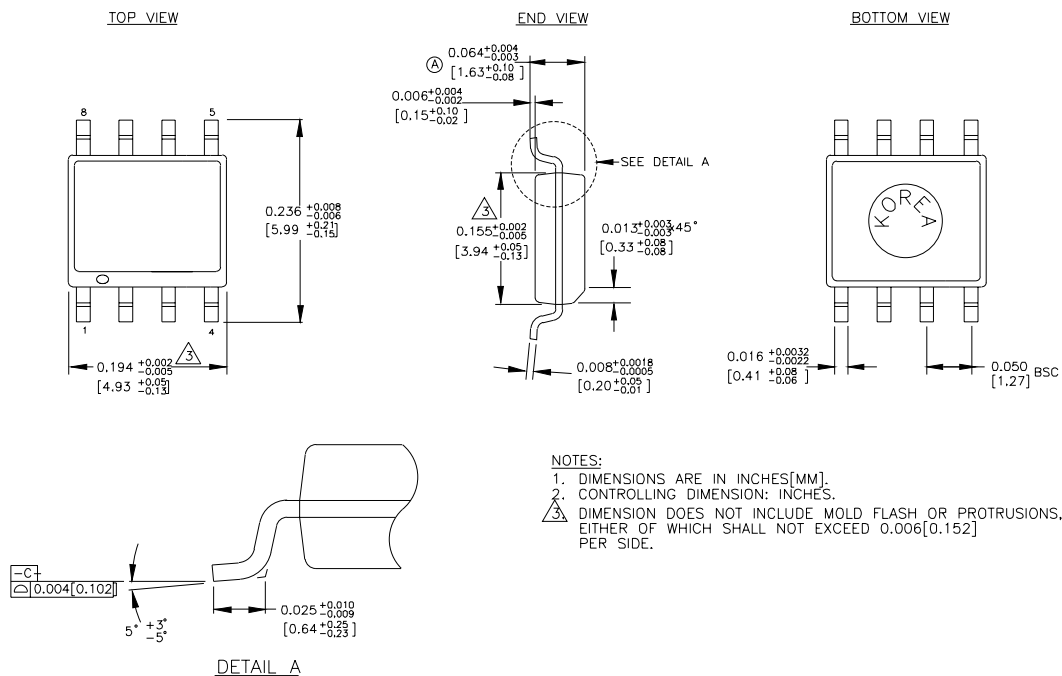
**AC ELECTRICAL CHARACTERISTICS<sup>(1, 2)</sup>** $V_{CC} = +3.3V \pm 5\%$  or  $+5.0V \pm 5\%$ 

| 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.                      | Max. | Min.                      | Max. |      |                               |
| $t_{PD}$       | Propagation Delay to Output D, ENECL/ENTTL | 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 $V_{CC} - 2.0V$ |
| $t_{skew}$     | Within-Device Skew <sup>(2, 3)</sup>       | —                         | 100  | —                       | 100  | —                         | 100  | —                         | 100  | ps   | $50\Omega$ to $V_{CC} - 2.0V$ |
| $t_r$<br>$t_f$ | Output Rise/Fall Time<br>20% to 80%        | 200                       | 500  | 200                     | 500  | 200                       | 500  | 200                       | 500  | ps   | $50\Omega$ to $V_{CC} - 2.0V$ |
| $f_{MAX}$      | Maximum Toggle Frequency                   | —                         | 800  | —                       | 800  | —                         | 800  | —                         | 800  | MHz  | $50\Omega$ to $V_{CC} - 2.0V$ |

**Notes:**

- 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.
- Guaranteed, but not tested.
- Same transition @common  $V_{CC}$  levels.

## 8-PIN PLASTIC SOIC (Z8-1)



Rev. 03

### 8-PIN MSOP (K8-1)



**6**

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