



**5V/3.3V**  
**1:2 DIFFERENTIAL**  
**FANOUT BUFFER**

**Precision Edge®**  
**SY10EL11V**  
**SY100EL11V**

## FEATURES

- 3.3V and 5V power supply options
- 265ps propagation delay
- 5ps skew between outputs
- High bandwidth output transitions
- Internal 75K $\Omega$  input pull-down resistors
- Replaces SY10/100EL11
- Improved output waveform characteristics
- Available in 8-pin SOIC package



Precision Edge®

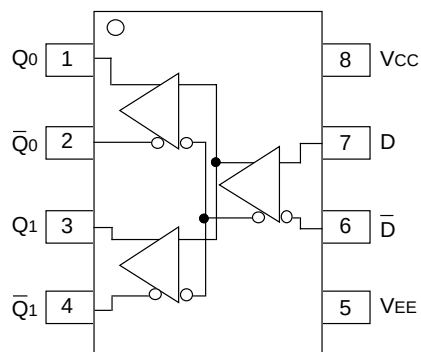
## DESCRIPTION

The SY10/100EL11V are 1:2 differential fanout gates. These devices are functionally similar to the E111A/L devices, with higher performance capabilities. Having within-device skews and output transition times significantly improved over the E111A/L, the EL11V is ideally suited for those applications which require the ultimate in AC performance.

The differential inputs of the EL11V employ clamping circuitry to maintain stability under open input conditions. If the inputs are left open (pulled to V<sub>EE</sub>), the Q outputs will go LOW.

## PIN NAMES

| Pin    | Function     |
|--------|--------------|
| D      | Data Inputs  |
| Q0, Q1 | Data Outputs |

**PACKAGE/ORDERING INFORMATION****8-Pin SOIC (Z8-1)****Ordering Information<sup>(1)</sup>**

| Part Number                      | Package Type | Operating Range | Package Marking                        | Lead Finish    |
|----------------------------------|--------------|-----------------|----------------------------------------|----------------|
| SY10EL11VZC                      | Z8-1         | Commercial      | HEL11V                                 | Sn-Pb          |
| SY10EL11VZCTR <sup>(2)</sup>     | Z8-1         | Commercial      | HEL11V                                 | Sn-Pb          |
| SY100EL11VZC                     | Z8-1         | Commercial      | XEL11V                                 | Sn-Pb          |
| SY100EL11VZCTR <sup>(2)</sup>    | Z8-1         | Commercial      | XEL11V                                 | Sn-Pb          |
| SY10EL11VZI                      | Z8-1         | Industrial      | HEL11V                                 | Sn-Pb          |
| SY10EL11VZITR <sup>(2)</sup>     | Z8-1         | Industrial      | HEL11V                                 | Sn-Pb          |
| SY100EL11VZI                     | Z8-1         | Industrial      | XEL11V                                 | Sn-Pb          |
| SY100EL11VZITR <sup>(2)</sup>    | Z8-1         | Industrial      | XEL11V                                 | Sn-Pb          |
| SY10EL11VZG <sup>(3)</sup>       | Z8-1         | Industrial      | HEL11V with Pb-Free bar-line indicator | Pb-Free NiPdAu |
| SY10EL11VZGTR <sup>(2, 3)</sup>  | Z8-1         | Industrial      | HEL11V with Pb-Free bar-line indicator | Pb-Free NiPdAu |
| SY100EL11VZG <sup>(3)</sup>      | Z8-1         | Industrial      | XEL11V with Pb-Free bar-line indicator | Pb-Free NiPdAu |
| SY100EL11VZGTR <sup>(2, 3)</sup> | Z8-1         | Industrial      | XEL11V with Pb-Free bar-line indicator | Pb-Free NiPdAu |

**Notes:**

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

**ABSOLUTE MAXIMUM RATINGS<sup>(1)</sup>**

| Symbol        | Rating                                                                                                                                                   | Value                  | Unit         |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--------------|
| $V_{CC}$      | Power Supply Voltage ( $V_{EE} = 0$ )                                                                                                                    | +6.0 to 0              | V            |
| $V_{EE}$      | Power Supply Voltage ( $V_{CC} = 0$ )                                                                                                                    | -6.0 to 0              | V            |
| $V_{IN}$      | Input Voltage ( $V_{CC} = 0V$ , $V_{IN}$ not more negative than $V_{EE}$ )<br>Input Voltage ( $V_{EE} = 0V$ , $V_{IN}$ not more positive than $V_{CC}$ ) | -6.0 to 0<br>+6.0 to 0 | V<br>V       |
| $I_{OUT}$     | Output Current<br>-Continuous<br>-Surge                                                                                                                  | 50<br>100              | mA           |
| $T_{LEAD}$    | Lead Temperature Range (soldering, 20sec.)                                                                                                               | +260                   | °C           |
| $T_A$         | Operating Temperature Range                                                                                                                              | -40 to +85             | °C           |
| $T_{store}$   | Storage Temperature Range                                                                                                                                | -65 to +150            | °C           |
| $\theta_{JA}$ | Thermal Resistance (Junction-to-Ambient)<br>-Still Air<br>-500lfpm                                                                                       | 160<br>109             | °C/W<br>°C/W |
| $\theta_{JC}$ | Thermal Resistance (Junction-to-Case)                                                                                                                    | 39                     | °C/W         |
| ESD           | Mil Std. 883 Human Body Model, All Pins                                                                                                                  | >1.5k                  | V            |

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

$V_{EE} = V_{EE} \text{ (Min.) to } V_{EE} \text{ (Max.)}; V_{CC} = \text{GND}$

| 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. |      |
| $I_{EE}$ | Power Supply Current | —                         | 26   | 31   | 15                      | 26   | 31   | 15                        | 26   | 31   | 15                        | 26   | 31   | mA   |
|          | 10EL                 | —                         | 26   | 31   | 15                      | 26   | 31   | 15                        | 26   | 31   | 15                        | 26   | 31   |      |
|          | 100EL                | —                         | 26   | 31   | 15                      | 26   | 31   | 15                        | 26   | 31   | 15                        | 30   | 36   |      |
| $I_{IH}$ | Input HIGH Current   | —                         | —    | 150  | —                       | —    | 150  | —                         | —    | 150  | —                         | —    | 150  | μA   |

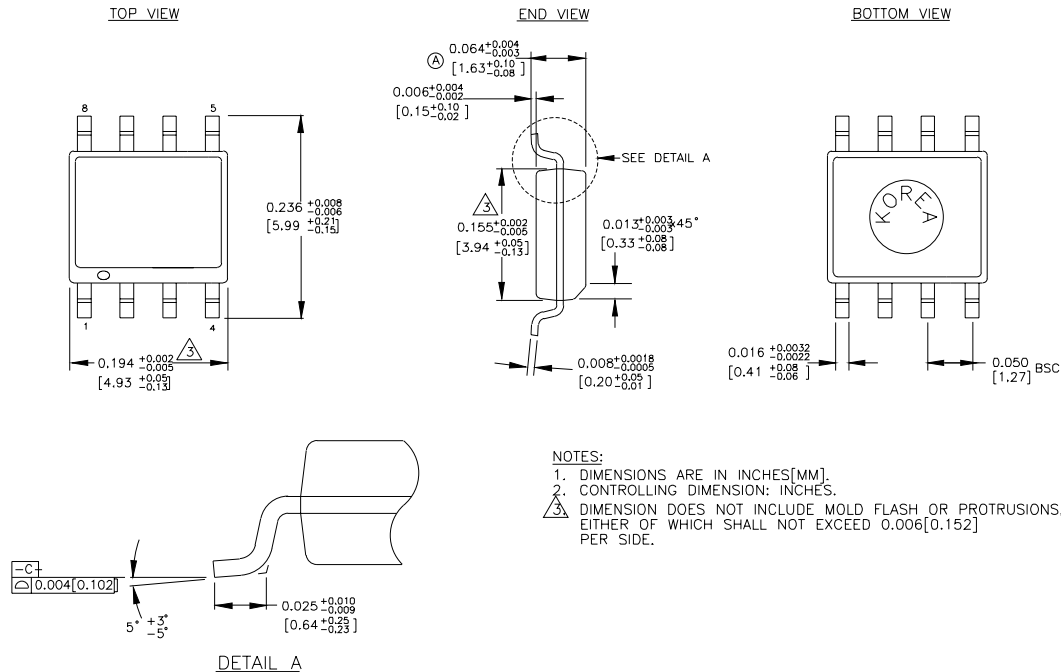
**Note 1.** Parametric values specified at: 10/100EL11V Series: -3.0V to -5.5V.

**AC ELECTRICAL CHARACTERISTICS<sup>(1)</sup>**

VEE = VEE (Min.) to VEE (Max.); VCC = GND

| Symbol       | Parameter                             | TA = -40°C |      |      | TA = 0°C |      |      | TA = +25°C |      |      | TA = +85°C |      |      | Unit |
|--------------|---------------------------------------|------------|------|------|----------|------|------|------------|------|------|------------|------|------|------|
|              |                                       | Min.       | Typ. | Max. | Min.     | Typ. | Max. | Min.       | Typ. | Max. | Min.       | Typ. | Max. |      |
| tPLH<br>tPHL | Propagation Delay to Output D         | 135        | 260  | 385  | 185      | 260  | 335  | 190        | 265  | 340  | 215        | 290  | 365  | ps   |
| tskew        | Within-Device Skew <sup>(2)</sup>     | —          | 5    | —    | —        | 5    | 20   | —          | 5    | 20   | —          | 5    | 20   | ps   |
|              | Duty Cycle Skew <sup>(3)</sup>        | —          | 5    | —    | —        | 5    | 20   | —          | 5    | 20   | —          | 5    | 20   |      |
| VPP          | Minimum Input Swing <sup>(4)</sup>    | 150        | —    | —    | 150      | —    | —    | 150        | —    | —    | 150        | —    | —    | mV   |
| VCMR         | Common Mode Range <sup>(5)</sup>      | -1.3       | —    | -0.4 | -1.4     | —    | -0.4 | -1.4       | —    | -0.4 | -1.4       | —    | -0.4 | V    |
| tr<br>tf     | Output Rise/Fall Times Q (20% to 80%) | 100        | 225  | 350  | 100      | 225  | 350  | 100        | 225  | 350  | 100        | 225  | 350  | ps   |

**Note 1.** Parametric values specified at: 10/100EL11V Series: -3.0V to -5.5V.**Note 2.** Within-device skew defined as identical transitions on similar paths through a device.**Note 3.** Duty cycle skew is the difference between a tPLH and tPHL propagation delay through a device.**Note 4.** Minimum input swing for which AC parameters are guaranteed. The device has a DC gain of  $\approx 40$ .**Note 5.** The CMR range is referenced to the most positive side of the differential input signal. Normal operation is obtained if the HIGH level falls within the specified range and the peak-to-peak voltage lies between VPP min. and 1V. The lower end of the CMR range varies 1:1 with VEE. The numbers in the spec table assume a nominal VEE = -3.3V. Note for PECL operation, the VCMR (min) will be fixed at 3.3V - |VCMR (min)|.

**8-PIN SOIC .150" WIDE (Z8-1)**

Rev. 03

**Package Notes:****Note 1.** Package meets Level 1 moisture sensitivity.**MICREL, INC. 2180 FORTUNE DRIVE SAN JOSE, CA 95131 USA**TEL + 1 (408) 944-0800 FAX + 1 (408) 474-1000 WEB <http://www.micrel.com>

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