

## FEATURES

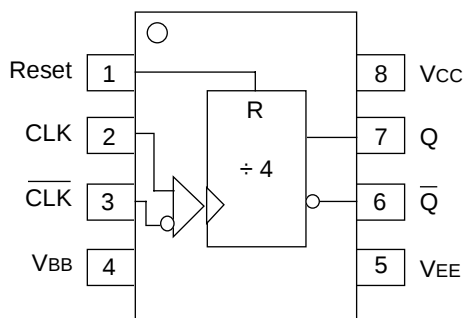
- 3.3V and 5V power supply options
- 650ps propagation delay
- 4.0GHz toggle frequency
- High bandwidth output transistions
- Internal 75K $\Omega$  input pull-down resistors
- Available in 8-pin SOIC package

## DESCRIPTION

The SY10/100EL33/L are integrated  $\div 4$  dividers. The differential clock inputs and the VBB allow a differential, single-ended or AC-coupled interface to the device. If used, the VBB output should be bypassed to ground with a 0.01 $\mu$ F capacitor. Also note that the VBB is designed to be used as an input bias on the EL33/L only; the VBB output has limited current sink and source capability.

The reset pin is asynchronous and is asserted on the rising edge. Upon power-up, the internal flip-flops will attain a random state; the reset input allows for the synchronization of multiple EL33/Ls in a system.

## PIN CONFIGURATION/BLOCK DIAGRAM



**SOIC  
TOP VIEW**

## PIN NAMES

| Pin   | Function                 |
|-------|--------------------------|
| CLK   | Clock Inputs             |
| Reset | Asynchronous Reset       |
| VBB   | Reference Voltage Output |
| Q     | Data Outputs             |

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

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.  |      |
| IEE             | Power Supply Current     |            |      |       |          |      |       |            |      |       |            |      |       | mA   |
|                 | 10EL                     | —          | 27   | 33    | —        | 27   | 33    | —          | 27   | 33    | —          | 27   | 33    |      |
|                 | 100EL                    | —          | 27   | 33    | —        | 27   | 33    | —          | 27   | 33    | —          | 31   | 37    |      |
| VBB             | Output Reference Voltage |            |      |       |          |      |       |            |      |       |            |      |       | V    |
|                 | 10EL                     | -1.43      | —    | -1.30 | -1.38    | —    | -1.27 | -1.35      | —    | -1.25 | -1.31      | —    | -1.19 |      |
|                 | 100EL                    | -1.38      | —    | -1.26 | -1.38    | —    | -1.26 | -1.38      | —    | -1.26 | -1.38      | —    | -1.26 |      |
| I <sub>IH</sub> | Input HIGH Current       | —          | —    | 150   | —        | —    | 150   | —          | —    | 150   | —          | —    | 150   | μA   |

**NOTE:**

1. Parametric values specified at:
- |                           |                     |                  |
|---------------------------|---------------------|------------------|
| 5 volt Power Supply Range | 100EL33 Series:     | -4.2V to -5.5V.  |
|                           | 10EL33 Series       | -4.75V to -5.5V. |
| 3 volt Power Supply Range | 10/100EL33L Series: | -3.0V to -3.8V.  |

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

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.       |           |
| f <sub>MAX</sub>                     | Maximum Toggle Frequency                 | 3.4        | 4.2        | —          | 3.8        | 4.2        | —          | 3.8        | 4.2        | —          | 3.8        | 4.2        | —          | GHz       |
| t <sub>PLH</sub><br>t <sub>PHL</sub> | Prop. Delay to Output D<br>Reset to Q    | 490        | 630<br>310 | 770<br>460 | 540<br>610 | 630<br>360 | 720<br>460 | 550<br>560 | 640<br>360 | 730<br>460 | 590<br>560 | 670<br>380 | 760<br>480 | ps<br>580 |
| V <sub>PP</sub>                      | Minimum Input Swing <sup>(2)</sup>       | 150        | —          | —          | 150        | —          | —          | 150        | —          | —          | 150        | —          | —          | mV        |
| t <sub>r</sub><br>t <sub>f</sub>     | Output Rise/Fall Times Q<br>(20% to 80%) | 100        | 225        | 350        | 100        | 225        | 350        | 100        | 225        | 350        | 100        | 225        | 350        | ps        |

**NOTES:**

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|---------------------------|---------------------|------------------|
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|                           | 10EL33 Series       | -4.75V to -5.5V. |
| 3 volt Power Supply Range | 10/100EL33L Series: | -3.0V to -3.8V.  |
2. Minimum input swing for which AC parameters are guaranteed.

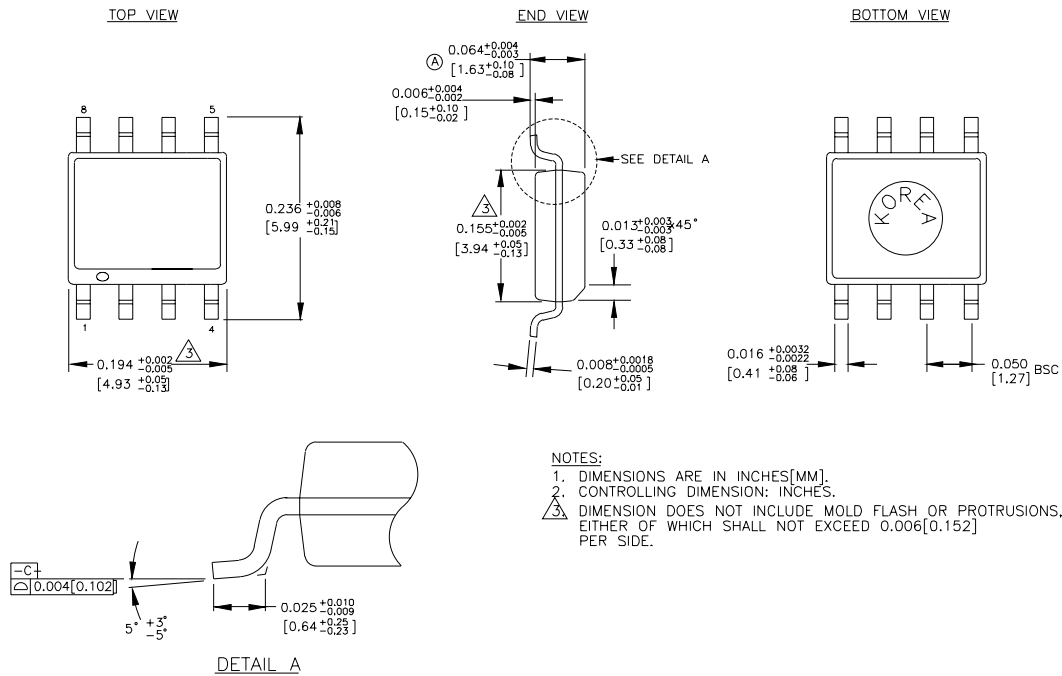
**PRODUCT ORDERING CODE****3.3V**

| Ordering Code  | Package Type | Operating Range | VEE Range (V) |
|----------------|--------------|-----------------|---------------|
| SY10EL33LZC    | Z8-1         | Commercial      | -3.0 to -3.8  |
| SY10EL33LZCTR  | Z8-1         | Commercial      | -3.0 to -3.8  |
| SY100EL33LZC   | Z8-1         | Commercial      | -3.0 to -3.8  |
| SY100EL33LZCTR | Z8-1         | Commercial      | -3.0 to -3.8  |

**5V**

| Ordering Code | Package Type | Operating Range | VEE Range (V) |
|---------------|--------------|-----------------|---------------|
| SY10EL33ZC    | Z8-1         | Commercial      | -4.75 to -5.5 |
| SY10EL33ZCTR  | Z8-1         | Commercial      | -4.75 to -5.5 |
| SY100EL33ZC   | Z8-1         | Commercial      | -4.2 to -5.5  |
| SY100EL33ZCTR | Z8-1         | Commercial      | -4.2 to -5.5  |

## 8 LEAD SOIC .150" WIDE (Z8-1)



Rev. 03

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

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

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