

**HIGH-PERFORMANCE PRODUCTS**
**Description**

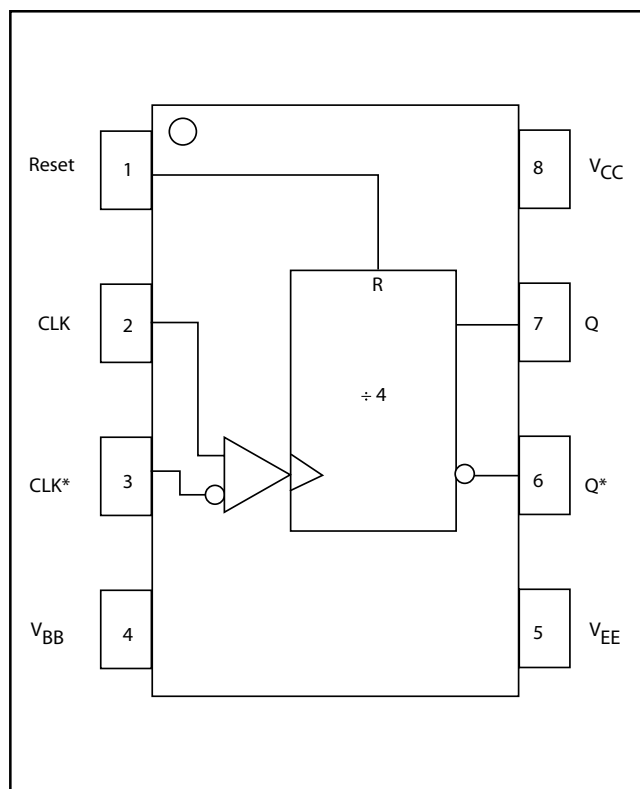
The SK10/100EL33W is a ÷4 Divider. This device is fully compatible with MC10/100EL33 and MC10/100LVEL33.

The SK10/100EL33W provides a  $V_{BB}$  output for either single-ended use or as a DC bias for AC coupling to the device. The  $V_{BB}$  pin should be used only as a bias for the SK10/100EL33W as its current sink/source capability is limited. Whenever used, the  $V_{BB}$  pin should be bypassed to  $V_{CC}$  via a 0.01  $\mu$ F capacitor.

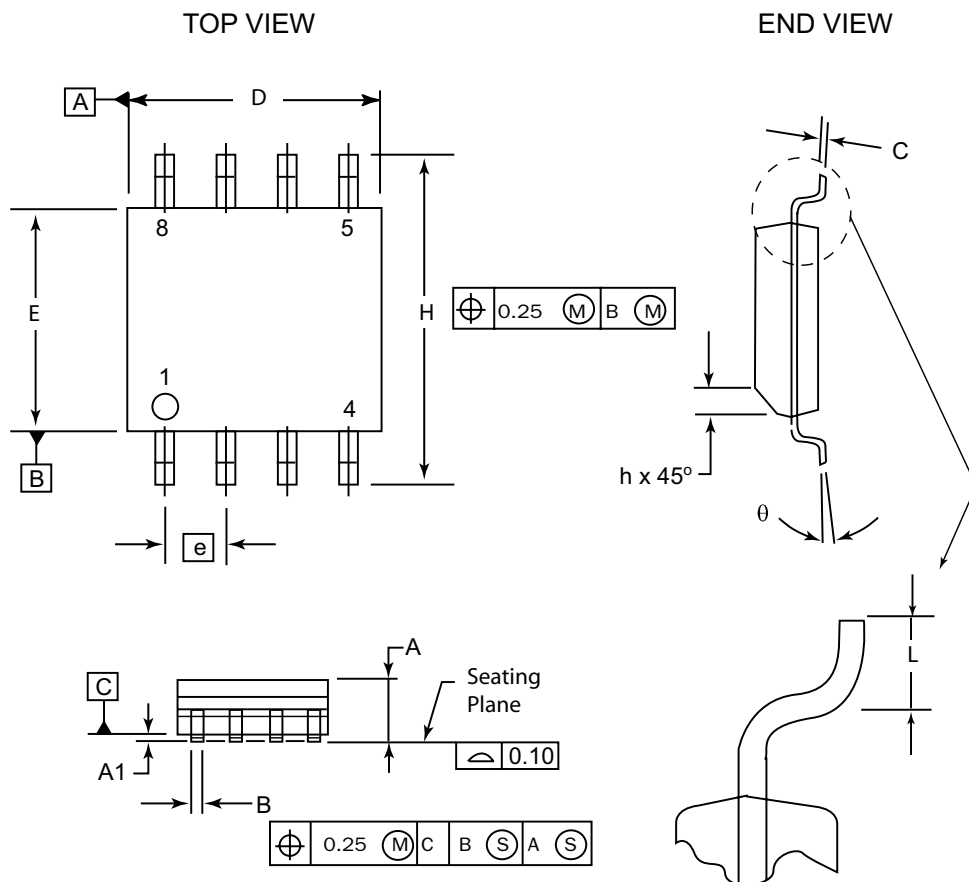
The Reset pin is asynchronous and is asserted on the rising edge. Upon power-up, the internal flip-flops will attain a random state. The Reset pin allows for the synchronization of multiple EL33W's in a system.

**Features**

- Extended Supply Voltage Range: ( $V_{EE} = -5.5V$  to  $-3.0V$ ,  $V_{CC} = 0V$ ) or ( $V_{CC} = +3.0V$  to  $+5.5V$ ,  $V_{EE} = 0V$ )
- High Bandwidth Output Transition
- 650ps Propagation Delay
- $V_{BB}$  Output
- 75K $\Omega$  Internal Input Pulldown Resistor
- 4.0 GHz Toggle Frequency
- New Differential Input Common Mode Range
- Fully Compatible with MC10/100EL33 and MC10/100LVEL33
- ESD Protection of >4000V
- Industrial Temperature Range:  $-40^{\circ}C$  to  $85^{\circ}C$
- Available in 8-Pin SOIC (150 mils) Package

**Functional Block Diagram**

**PIN Description**

| Pin       | Function           |
|-----------|--------------------|
| CLK, CLK* | Clock Inputs       |
| Reset     | Asynch Reset       |
| $V_{BB}$  | Ref Voltage Output |
| Q, Q*     | Data Outputs       |

**8 Pin SOIC Package**


| DIM | MILLIMETERS |      |
|-----|-------------|------|
|     | MIN         | MAX  |
| A   | 1.35        | 1.75 |
| A1  | 0.10        | 0.25 |
| B   | 0.35        | 0.49 |
| C   | 0.19        | 0.25 |
| D   | 4.80        | 5.00 |
| E   | 3.80        | 4.00 |
| e   | 1.27 BSC    |      |
| H   | 5.80        | 6.20 |
| h   | 0.25        | 0.50 |
| L   | 0.40        | 1.25 |
| θ   | 0°          | 7°   |

**NOTES:**

1. Dimensions are in millimeters.
2. Dimensions D and E do not include mold protrusion.
3. Maximum mold protrusion 0.15 per side.
4. Dimension B does not include Dambar protrusion. Allowable Dambar protrusion shall be 0.127 total in excess of the B dimension at maximum material condition.

**HIGH-PERFORMANCE PRODUCTS**
**DC Characteristics**
**SK10/100EL33W DC Electrical Characteristics (Notes 1, 2)**
 $(V_{CC} - V_{EE} = 3.0V \text{ to } 5.5V; V_{OUT} \text{ Loaded } 50\Omega \text{ to } V_{CC} - 2.0V)$ 

| Symbol                            | Characteristic                                         | 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            |          |
| I <sub>IN</sub>                   | Input Current (Diff)<br>(SE)                           | -150           |          | 150<br>150     | -150           |          | 150<br>150     | -150           |          | 150<br>150     | -150           |          | 150<br>150     | μA<br>μA |
| I <sub>EE</sub>                   | Power Supply Current<br>10EL<br>100EL                  | 16<br>20       | 23<br>27 | 30<br>38       | 16<br>20       | 23<br>27 | 30<br>38       | 16<br>20       | 23<br>27 | 30<br>38       | 16<br>20       | 23<br>27 | 30<br>38       | mA<br>mA |
| V <sub>BB</sub>                   | Output Reference Voltage <sup>5</sup><br>10EL<br>100EL | -1.43<br>-1.38 |          | -1.30<br>-1.26 | -1.38<br>-1.38 |          | -1.27<br>-1.26 | -1.35<br>-1.38 |          | -1.25<br>-1.26 | -1.31<br>-1.38 |          | -1.19<br>-1.26 | V<br>V   |
| V <sub>CC</sub> - V <sub>EE</sub> | Power Supply Voltage                                   | 3.0            |          | 5.5            | 3.0            |          | 5.5            | 3.0            |          | 5.5            | 3.0            |          | 5.5            | V        |

**AC Characteristics**
**SK10/100EL33W AC Characteristics (Notes 1, 2)**
 $(V_{CC} - V_{EE} = 3.0V \text{ to } 5.5V; V_{OUT} \text{ Loaded } 50\Omega \text{ to } V_{CC} - 2.0V)$ 

| Symbol                               | Characteristic                                 | 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> | Propagation Delay<br>CLK to Q<br>Reset to Q    | 550<br>430            | 590<br>490 | 660<br>555            | 555<br>410            | 600<br>475 | 670<br>555            | 565<br>400            | 610<br>460 | 680<br>555            | 590<br>355            | 625<br>440 | 730<br>560            | ps<br>ps |
| t <sub>skew</sub>                    | Duty Cycle Skew                                |                       |            | 20                    |                       |            | 20                    |                       |            | 20                    |                       |            | 20                    | ps       |
| V <sub>PP</sub> <sup>3</sup>         | Minimum Input Swing                            | 150                   |            | 1000                  | 150                   |            | 1000                  | 150                   |            | 1000                  | 150                   |            | 1000                  | mV       |
| V <sub>CMR</sub> <sup>4</sup>        | Common Mode Range                              | V <sub>EE</sub> + 1.7 |            | V <sub>CC</sub> - 0.4 | V <sub>EE</sub> + 1.7 |            | V <sub>CC</sub> - 0.4 | V <sub>EE</sub> + 1.7 |            | V <sub>CC</sub> - 0.4 | V <sub>EE</sub> + 1.7 |            | V <sub>CC</sub> - 0.4 | V        |
| t <sub>r</sub><br>t <sub>f</sub>     | Output Rise/Fall Times<br>(20% – 80%)<br>Q, Q* | 125                   | 150        | 210                   | 130                   | 160        | 215                   | 135                   | 165        | 220                   | 145                   | 170        | 225                   | ps       |

## HIGH-PERFORMANCE PRODUCTS

### AC Characteristics *(continued)*

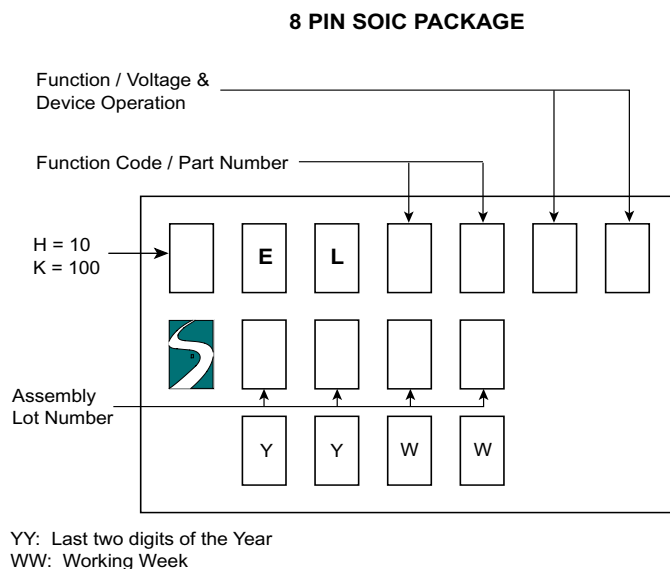
#### Notes:

- 10EL circuits are designed to meet the DC specifications shown in the table after thermal equilibrium has been established. The circuit is in a test socket or mounted on a printed circuit board and transverse airflow greater than 500 lfpm is maintained. Outputs are terminated through a 50W resistor to VCC - 2.0V except where otherwise specified on the individual data sheets.
- 100K circuits are designed to meet the DC specifications shown in the table where transverse airflow greater than 500 lfpm is maintained.
- Minimum input swing for which AC parameters are guaranteed.
- 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  $V_{PP(min)}$  and 1V. The lower end of the CMR range varies 1:1 with VEE and is equal to VEE + 1.7V.
- Voltages referenced to VCC = 0V.
- For standard ECL DC specifications, refer to the ECL Logic Family Standard DC Specifications Data Sheet.
- For part ordering description, see HPP Part Ordering Information Data Sheet.

### Ordering Information

| Ordering Code | Package ID | Temperature Range |
|---------------|------------|-------------------|
| SK10EL33WD    | 8-SOIC     | Industrial        |
| SK10EL33WDT   | 8-SOIC     | Industrial        |
| SK100EL33WD   | 8-SOIC     | Industrial        |
| SK100EL33WDT  | 8-SOIC     | Industrial        |
| SK10EL33WU    | Die        |                   |
| SK100EL33WU   | Die        |                   |

### Marking Information



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