

FEATURES

- 3.3V and 5V power supply options
- Typical 30ps output-to-output skew
- Max. 50ps output-to-output skew
- Synchronous enable/disable
- Multiplexed clock input
- 75KΩ internal input pull-down resistors
- Available in 20-pin SOIC package



Precision Edge™

DESCRIPTION

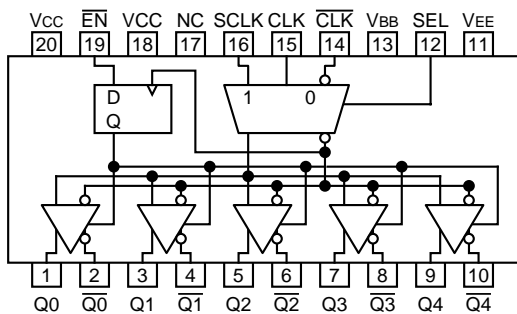
The SY100EL14V is a low skew 1:5 clock distribution chip designed explicitly for low skew clock distribution applications. The device can be driven by either a differential or single-ended ECL or, if positive power supplies are used, PECL input signal. The EL14V is suitable for operation in systems operating from 3.3V to 5.0V supplies. If a single-ended input is to be used the VBB output should be connected to the $\overline{\text{CLK}}$ input and bypassed to ground via a 0.01μF capacitor. The VBB output is designed to act as the switching reference for the input of the EL14V under single-ended input conditions, as a result this pin can only source/sink up to 0.5mA of current.

The EL14V features a multiplexed clock input to allow for the distribution of a lower speed scan or test clock along with the high speed system clock. When LOW (or left open and pulled LOW by the input pull-down resistor) the SEL pin will select the differential clock input.

The common enable ($\overline{\text{EN}}$) is synchronous so that the outputs will only be enabled/disabled when they are already in the LOW state. This avoids any chance of generating a runt clock pulse when the device is enabled/disabled as can happen with an asynchronous control. The internal flip flop is clocked on the falling edge of the input clock, therefore all associated specification limits are referenced to the negative edge of the clock input.

When both differential inputs are left open, CLK input will pull down to VEE and $\overline{\text{CLK}}$ input will bias around $V_{cc}/2$.

PIN CONFIGURATION/BLOCK DIAGRAM



SOIC
TOP VIEW

PIN NAMES

| Pin | Function |
|------|----------------------------|
| CLK | Differential Clock Inputs |
| SCLK | Scan Clock Input |
| EN | Synchronous Enable |
| SEL | Clock Select Input |
| VBB | Reference Output |
| Q0-4 | Differential Clock Outputs |

TRUTH TABLE

| CLK | SCLK | SEL | $\overline{\text{EN}}$ | Q |
|-----|------|-----|------------------------|----|
| L | X | L | L | L |
| H | X | L | L | H |
| X | L | H | L | L |
| X | H | H | L | H |
| X | X | X | H | L* |

* On next negative transition of CLK or SCLK

ABSOLUTE MAXIMUM RATINGS⁽¹⁾

| Symbol | Rating | Value | Unit |
|--------------------------------|---|--------------|------|
| V _{EE} | Power Supply (V _{CC} = 0V) | -8.0 to 0 | VDC |
| V _{IN} ⁽³⁾ | Input Voltage (V _{CC} = 0V) | 0 to -6.0 | VDC |
| I _{OUT} | Output Current -Continuous -Surge | 50 100 | mA |
| T _A | Operating Temperature Range | -40 to +85 | °C |
| V _{EE} | Operating Range ^{(1),(2)} | -5.7 to -3.0 | V |

Notes:

1. Absolute maximum rating, beyond which, device life may be impaired, unless otherwise specified on an individual data sheet.
2. Parametric values specified at: 100EL14V Series: -3.0V to -5.5V.
3. In PECL mode operation, V_{IN} (max) = V_{CC}.

DC ELECTRICAL CHARACTERISTICSV_{EE} = V_{EE} (Min) to V_{EE} (Max); V_{CC} = GND⁽¹⁾

| Symbol | Parameter | T _A = -40°C | | | T _A = 0°C | | | T _A = +25°C | | | T _A = +85°C | | | Unit |
|------------------|---|------------------------|--------|--------|----------------------|--------|--------|------------------------|--------|--------|------------------------|--------|--------|------|
| | | Min. | Typ. | Max. | Min. | Typ. | Max. | Min. | Typ. | Max. | Min. | Typ. | Max. | |
| V _{OH} | Output HIGH Voltage ⁽²⁾ | -1085 | -1005 | -880 | -1025 | -955 | -880 | -1025 | -955 | -880 | -1025 | -955 | -880 | mV |
| V _{OL} | Output LOW Voltage ⁽²⁾ | -1830 | -1695 | -1555 | -1810 | -1705 | -1620 | -1810 | -1705 | -1620 | -1810 | -1705 | -1620 | mV |
| V _{OHA} | Output HIGH Voltage ⁽²⁾ | -1095 | — | — | -1035 | — | — | -1035 | — | — | -1035 | — | — | mV |
| V _{OLA} | Output LOW Voltage ⁽²⁾ | — | — | -1555 | — | — | -1610 | — | — | -1610 | — | — | -1610 | mV |
| V _{IH} | Input HIGH Voltage | -1165 | — | -880 | -1165 | — | -880 | -1165 | — | -880 | -1165 | — | -880 | mV |
| V _{IL} | Input LOW Voltage | -1810 | — | -1475 | -1810 | — | -1475 | -1810 | — | -1475 | -1810 | — | -1475 | mV |
| I _{IL} | Input LOW Current ⁽³⁾ CLK | 0.5 -300 | — — | — — | 0.5 -300 | — — | — — | 0.5 -300 | — — | — — | 0.5 -300 | — — | — — | μA |
| I _{IH} | Input High Current | — | — | 150 | — | — | 150 | — | — | 150 | — | — | 150 | μA |
| I _{EE} | Power Supply Current | — | 32 | 40 | — | 32 | 40 | — | 32 | 40 | — | 34 | 42 | mA |
| V _{BB} | Output Reference Voltage | -1.38 | — | -1.26 | -1.38 | — | -1.26 | -1.38 | — | -1.26 | -1.38 | — | -1.26 | V |

Notes:

1. This table replaces the three traditionally seen in ECL 100K data books. The same DC parameter values at V_{EE} = -4.5V now apply across the full V_{EE} range of -3.0V to -5.5V. Outputs are terminated through a 50Ω resistor to -2.0V except where otherwise specified on the individual data sheets.
2. V_{IN} = V_{IH}(Max) or V_{IL}(Min).
3. V_{IN} = V_{IL}(Max).

AC ELECTRICAL CHARACTERISTICSV_{EE} = V_{EE} (Min) to V_{EE} (Max); V_{CC} = GND

| Symbol | Parameter | T _A = -40°C | | T _A = 0°C | | T _A = +25°C | | | T _A = +85°C | | Unit |
|--------------------------------------|--|------------------------|--------------|----------------------|--------------|------------------------|--------|--------------|------------------------|--------------|------|
| | | Min. | Max. | Min. | Max. | Min. | Typ. | Max. | Min. | Max. | |
| t _{PLH} t _{PHL} | Propagation Delay CLK to Q (Diff) CLK to Q (SE) SCLK to Q | 520 | 720 | 550 | 750 | 580 | 680 | 780 | 630 | 830 | ps |
| t _{skew} | Part-to-Part Skew ⁽¹⁾ Within-Device Skew | — | 200 | — | 200 | — | — | 200 | — | 200 | ps |
| t _S | Setup Time \overline{EN} | 150 | — | 150 | — | 150 | — | — | 150 | — | ps |
| t _H | Hold Time \overline{EN} | 200 | — | 200 | — | 200 | — | — | 200 | — | ps |
| V _{PP} | Minimum Input Swing CLK | 150 | — | 150 | — | 150 | — | — | 150 | — | mV |
| V _{CMR} | Common Mode Range ⁽²⁾ V _{PP} < 500mV V _{PP} ≥ 500mV | -2.0 -1.8 | -0.4 -0.4 | -2.1 -1.9 | -0.4 -0.4 | -2.1 -1.9 | — — | -0.4 -0.4 | -2.1 -1.9 | -0.4 -0.4 | mV |
| t _r t _f | Output Rise/Fall Times Q (20% – 80%) | 230 | 500 | 230 | 500 | 230 | 360 | 500 | 230 | 500 | ps |

Notes:

- Skews are specified for identical LOW-to-HIGH or HIGH-to-LOW transitions.
- The V_{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 V_{CMR} range varies 1:1 with V_{EE}. The numbers in the specification table assume a nominal V_{EE} = -3.3V. For PECL operation, the V_{CMR}(Min) will be fixed at 3.3V – |V_{CMR}(Min)|.

PRODUCT ORDERING CODE

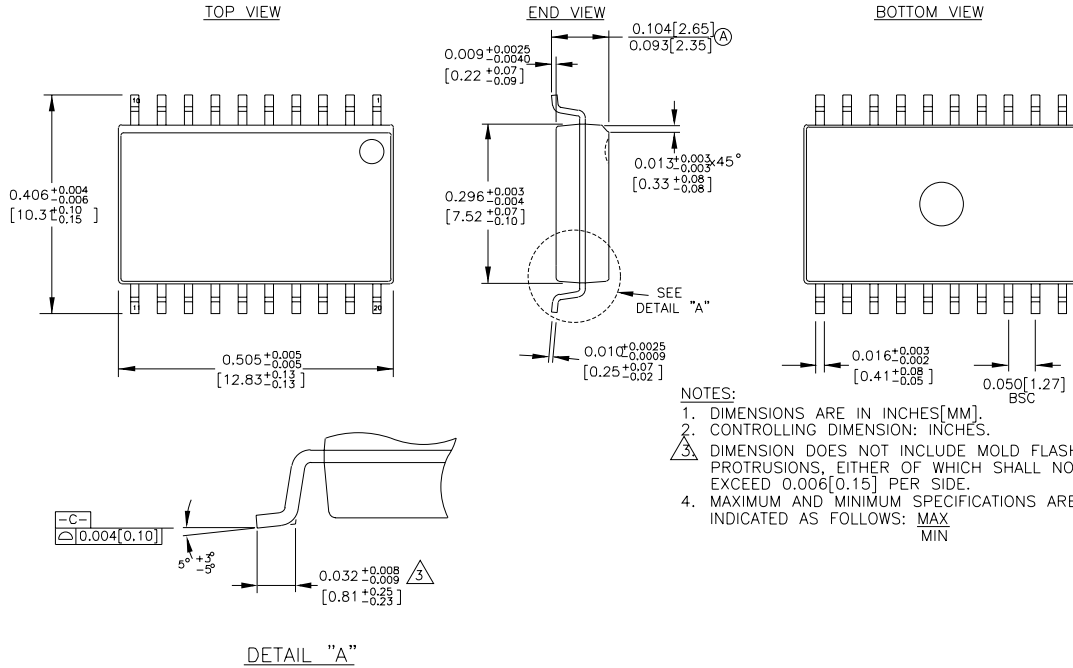
| Ordering Code | Package Type | Operating Range | Marking Code |
|-------------------------------|--------------|-----------------|--------------|
| SY100EL14VZC | Z20-1 | Commercial | XEL14V |
| SY100EL14VZCTR ⁽²⁾ | Z20-1 | Commercial | XEL14V |

Notes:

- Recommended for new designs.
- Tape and Reel.
- Pb-Free (lead-free).

| Ordering Code | Package Type | Operating Range | Marking Code |
|-----------------------------------|--------------|-----------------|--------------|
| SY100EL14VZI ⁽¹⁾ | Z20-1 | Industrial | XEL14V |
| SY100EL14VZITR ^(1,2) | Z20-1 | Industrial | XEL14V |
| SY100EL14VZY ⁽³⁾ | Z20-1 | Industrial | XEL14V |
| SY100EL14VZYTR ^(1,2,3) | Z20-1 | Industrial | XEL14V |

20 LEAD SOIC .300" WIDE (Z20-1)



Rev. 03

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