

**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
- 75K $\Omega$  internal input pull-down resistors
- Available in 20-pin SOIC package

**Precision Edge<sup>®</sup>****DESCRIPTION**

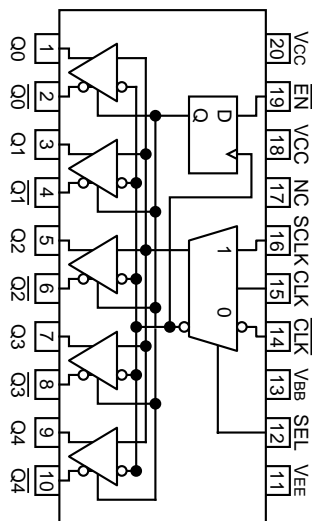
The SY100EL14V is a low skew 1:5 clock distribution chip designed explicitly for low skew clock distribution applications. The device can be driven by either a differential or single-ended ECL or, if positive power supplies are used, PECL input signal. The EL14V is suitable for operation in systems operating from 3.3V to 5.0V supplies. If a single-ended input is to be used the V<sub>BB</sub> output should be connected to the  $\overline{\text{CLK}}$  input and bypassed to ground via a 0.01 $\mu\text{F}$  capacitor. The V<sub>BB</sub> 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 V<sub>EE</sub> and  $\overline{\text{CLK}}$  input will bias around V<sub>CC</sub>/2.

**PACKAGE/ORDERING INFORMATION<sup>(1)</sup>**



**20-Pin Narrow SOIC  
TOP VIEW**

Part Number	Package Type	Operating Range	Package Marking	Lead Finish
SY100EL14VZC	Z20-1	Commercial	SY100EL14VZC	Sn-Pb
SY100EL14VZCTR <sup>(2)</sup>	Z20-1	Commercial	SY100EL14VZC	Sn-Pb
SY100EL14VZI	Z20-1	Industrial	SY100EL14VZI	Sn-Pb
SY100EL14VZITR <sup>(2)</sup>	Z20-1	Industrial	SY100EL14VZI	Sn-Pb
SY100EL14VZG <sup>(3)</sup>	Z20-1	Industrial	SY100EL14VZG with Pb-Free bar-line indicator	Pb-Free NiPdAu
SY100EL14VZGTR <sup>(2, 3)</sup>	Z20-1	Industrial	SY100EL14VZG 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.

**PIN NAMES**

Pin	Function
CLK	Differential Clock Inputs
SCLK	Scan Clock Input
$\overline{EN}$	Synchronous Enable
SEL	Clock Select Input
VBB	Reference Output
Q0-4	Differential Clock Outputs

**TRUTH TABLE**

CLK	SCLK	SEL	$\overline{EN}$	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 <sup>(1)</sup>

**Note:**

1. On next negative transition of CLK or SCLK

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

Symbol	Rating	Value	Unit
V <sub>EE</sub>	Power Supply (V <sub>CC</sub> = 0V)	-8.0 to 0	VDC
V <sub>IN</sub> <sup>(3)</sup>	Input Voltage (V <sub>CC</sub> = 0V)	0 to -6.0	VDC
I <sub>OUT</sub>	Output Current -Continuous -Surge	50 100	mA
T <sub>LEAD</sub>	Lead Temperature (soldering, 20sec.)	+260	°C
T <sub>A</sub>	Operating Temperature Range	-40 to +85	°C
V <sub>EE</sub>	Operating Range <sup>(1),(2)</sup>	-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<sub>IN</sub> (max) = V<sub>CC</sub>.

**DC ELECTRICAL CHARACTERISTICS**V<sub>EE</sub> = V<sub>EE</sub> (Min) to V<sub>EE</sub> (Max); V<sub>CC</sub> = GND<sup>(1)</sup>

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
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
VOH	Output HIGH Voltage <sup>(2)</sup>	-1085	-1005	-880	-1025	-955	-880	-1025	-955	-880	-1025	-955	-880	mV
VOL	Output LOW Voltage <sup>(2)</sup>	-1830	-1695	-1555	-1810	-1705	-1620	-1810	-1705	-1620	-1810	-1705	-1620	mV
VOHA	Output HIGH Voltage <sup>(2)</sup>	-1095	—	—	-1035	—	—	-1035	—	—	-1035	—	—	mV
VOLA	Output LOW Voltage <sup>(2)</sup>	—	—	-1555	—	—	-1610	—	—	-1610	—	—	-1610	mV
VIH	Input HIGH Voltage	-1165	—	-880	-1165	—	-880	-1165	—	-880	-1165	—	-880	mV
VIL	Input LOW Voltage	-1810	—	-1475	-1810	—	-1475	-1810	—	-1475	-1810	—	-1475	mV
IIL	Input LOW Current <sup>(3)</sup> CLK	0.5 -300	— —	— —	0.5 -300	— —	— —	0.5 -300	— —	— —	0.5 -300	— —	— —	μA
I <sub>IH</sub>	Input High Current	—	—	150	—	—	150	—	—	150	—	—	150	μA
IEE	Power Supply Current	—	32	40	—	32	40	—	32	40	—	34	42	mA
V <sub>BB</sub>	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<sub>EE</sub> = -4.5V now apply across the full V<sub>EE</sub> 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<sub>IN</sub> = V<sub>IH</sub>(Max) or V<sub>IL</sub>(Min).
3. V<sub>IN</sub> = V<sub>IL</sub>(Max).

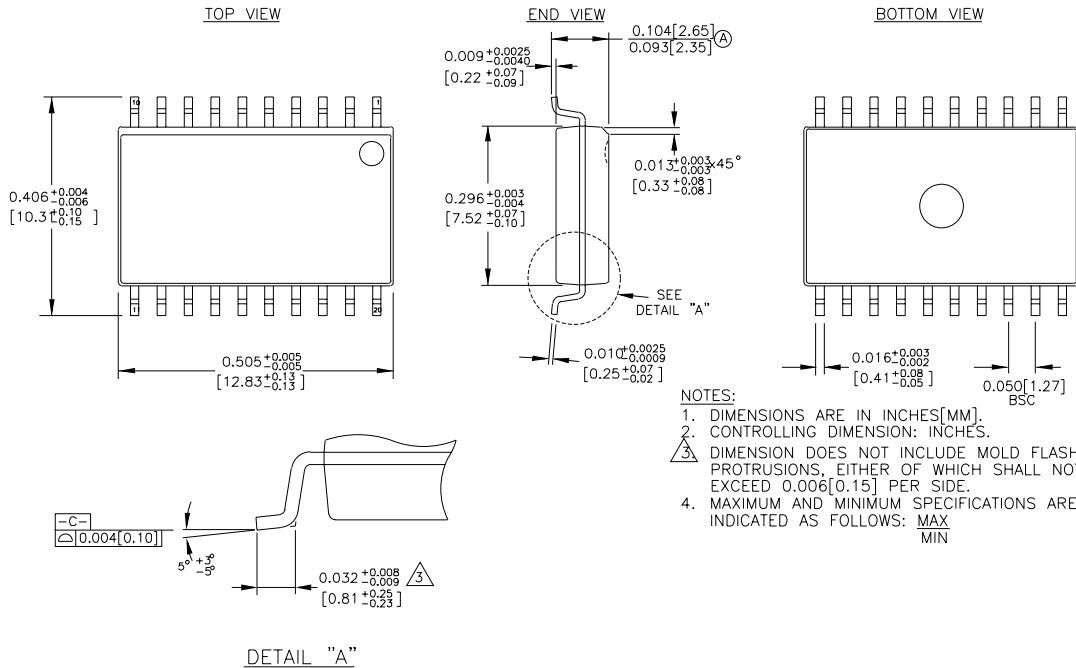
**AC ELECTRICAL CHARACTERISTICS**V<sub>EE</sub> = V<sub>EE</sub> (Min) to V<sub>EE</sub> (Max); V<sub>CC</sub> = GND

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
		Min.	Max.	Min.	Max.	Min.	Typ.	Max.	Min.	Max.	
t <sub>PLH</sub> t <sub>PHL</sub>	Propagation Delay CLK to Q (Diff) CLK to Q (SE) SCLK to Q	520 470 470	720 770 770	550 500 500	750 800 800	580 530 530	680 680 680	780 830 830	630 580 580	830 880 880	ps
t <sub>skew</sub>	Part-to-Part Skew <sup>(1)</sup> Within-Device Skew	— —	200 50	— —	200 50	— —	— —	200 50	— —	200 50	ps
t <sub>S</sub>	Setup Time $\overline{EN}$	150	—	150	—	150	—	—	150	—	ps
t <sub>H</sub>	Hold Time $\overline{EN}$	200	—	200	—	200	—	—	200	—	ps
V <sub>PP</sub>	Minimum Input CLK Swing	150	—	150	—	150	—	—	150	—	mV
V <sub>CMR</sub>	Common Mode Range <sup>(2)</sup> V <sub>PP</sub> < 500mV V <sub>PP</sub> ≥ 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 <sub>r</sub> t <sub>f</sub>	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<sub>CMR</sub> 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<sub>PP</sub>(Min) and 1V. The lower end of the V<sub>CMR</sub> range varies 1:1 with V<sub>EE</sub>. The numbers in the specification table assume a nominal V<sub>EE</sub> = -3.3V. For PECL operation, the V<sub>CMR</sub>(Min) will be fixed at 3.3V – |V<sub>CMR</sub>(Min)|.

**20-PIN SOIC .300" WIDE (Z20-1)**



Rev. 03

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