

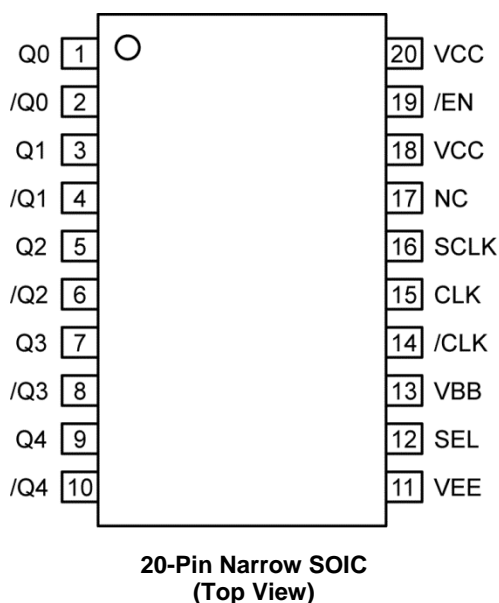
## Ordering Information<sup>(1)</sup>

Part Number	Package Type	Operating Range	Package Marking	Lead Finish
SY100EL14VZG	Z20-1	Industrial	SY100EL14VZG with Pb-Free bar-line indicator	Pb-Free NiPdAu
SY100EL14VZG TR <sup>(2)</sup>	Z20-1	Industrial	SY100EL14VZG with Pb-Free bar-line indicator	Pb-Free NiPdAu

### Note:

1. Contact factory for die availability. Dice are guaranteed at  $T_A = 25^\circ\text{C}$ , DC electricals only.
2. Tape and Reel.

## Pin Configuration



## Pin Description

Pin	Function
CLK	Differential clock inputs
SCLK	Scan clock input
/EN	Synchronous enable
SEL	Clock select input
VBB	Reference output
Q0 – Q4	Differential clock outputs

## Truth Table

CLK	SCLK	SEL	/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>(3)</sup>

### Note:

3. On next negative transition of CLK or SCLK

**Absolute Maximum Ratings<sup>(4)</sup>**Input Voltage ( $V_{IN}$ )<sup>(6)</sup>( $V_{CC} = 0V$ ,  $V_{IN}$  not more positive than  $V_{CC}$ ) .. -6V to +0V( $V_{EE} = 0V$ ,  $V_{IN}$  not more positive than  $V_{CC}$ )... +0V to +6VOperating Range ( $V_{EE}$ )<sup>(7)</sup> ..... -5.7V to -3.0VOutput Current ( $I_{OUT}$ ) Continuous.....50mA

Surge.....100mA

Lead Temperature (soldering, 20s).....260°C

Storage Temperature ( $T_s$ ) ..... -65 to +150°CESD Rating<sup>(8)</sup> ..... >1.5kV**Operating Ratings<sup>(5)</sup>**Supply Voltage ( $V_{CC}$ ) PECL Operation ..... 3.0V to 5.5V( $V_{EE}$ ) ECL Operation ..... -3.0V to -5.5VAmbient Temperature ( $T_A$ ) ..... -40°C to +85°C

Junction Thermal Resistance

SOIC ( $\theta_{JA}$ ) ..... 58°C/W**DC Electrical Characteristics<sup>(9)</sup>** $V_{EE} = V_{EE} \text{ (min) to } V_{EE} \text{ (max)}; V_{CC} = \text{GND}, T_A = -40^\circ\text{C to } +85^\circ\text{C}$ , unless otherwise stated.Outputs are terminated through a 50 $\Omega$  resistor to  $V_{CC}$ -2.0V.

Symbol	Parameter	Condition	Min.	Typ.	Max.	Units
$V_{OH}$	Output High Voltage <sup>(10)</sup>	$T_A = -40^\circ\text{C}$	$V_{CC} - 1.085$	$V_{CC} - 1.005$	$V_{CC} - 0.880$	V
		$T_A = 0^\circ\text{C to } +85^\circ\text{C}$	$V_{CC} - 1.025$	$V_{CC} - 0.955$	$V_{CC} - 0.880$	V
$V_{OL}$	Output Low Voltage <sup>(10)</sup>	$T_A = -40^\circ\text{C}$	$V_{CC} - 1.830$	$V_{CC} - 1.695$	$V_{CC} - 1.555$	V
		$T_A = 0^\circ\text{C to } +85^\circ\text{C}$	$V_{CC} - 1.810$	$V_{CC} - 1.705$	$V_{CC} - 1.620$	V
$V_{OHA}$	Output High Voltage <sup>(10)</sup>	$T_A = -40^\circ\text{C}$	$V_{CC} - 1.095$			V
		$T_A = 0^\circ\text{C to } +85^\circ\text{C}$	$V_{CC} - 1.035$			V
$V_{OLA}$	Output Low Voltage <sup>(10)</sup>	$T_A = -40^\circ\text{C}$			$V_{CC} - 1.555$	V
		$T_A = 0^\circ\text{C to } +85^\circ\text{C}$			$V_{CC} - 1.610$	V
$V_{IH}$	Input High Voltage		$V_{CC} - 1.165$		$V_{CC} - 0.880$	V
$V_{IL}$	Input Low Voltage		$V_{CC} - 1.810$		$V_{CC} - 1.475$	V
$I_{IL}$	Input Low Current <sup>(11)</sup>	Input LOW Current /CLK	0.5 -300			$\mu\text{A}$
$I_{IH}$	Input High Current				150	$\mu\text{A}$
$I_{EE}$	Power Supply Current	$T_A = -40^\circ\text{C to } +25^\circ\text{C}$		32	40	mA
		$T_A = +85^\circ\text{C}$		34	42	
$V_{BB}$	Output Reference Voltage		$V_{CC} - 1.380$		$V_{CC} - 1.260$	V

**Notes:**

- Exceeding the absolute maximum ratings may damage the device.
- The device is not guaranteed to function outside its operating ratings.
- In PECL mode operation,  $V_{IN}(\text{max}) = V_{CC}$ .
- Parametric values specified at 100EL14V series: -3.0V to -5.5V.
- Devices are ESD sensitive. Handling precautions are recommended. Human body model, 1.5k $\Omega$  in series with 100pF.
- Specification for packaged product only
- $V_{IN} = V_{IH}(\text{max})$  or  $V_{IL}(\text{min})$ .
- $V_{IN} = V_{IL}(\text{max})$ .

## AC Electrical Characteristics

$V_{EE} = V_{EE}(\text{min})$  to  $V_{EE}(\text{max})$ ;  $V_{CC} = \text{GND}$ ,  $T_A = -40^\circ\text{C}$  to  $+85^\circ\text{C}$ , unless otherwise stated.

Symbol	Parameter	Condition	Min.	Typ.	Max.	Units
$t_{PLH}$ $t_{PHL}$	Propagation Delay CLK to Q (Diff)	$T_A = -40^\circ\text{C}$	520		720	ps
		$T_A = 0^\circ\text{C}$	550		750	ps
		$T_A = +25^\circ\text{C}$	580	680	780	ps
		$T_A = +85^\circ\text{C}$	630		830	ps
	Propagation Delay CLK to Q (SE)	$T_A = -40^\circ\text{C}$	470		770	ps
		$T_A = 0^\circ\text{C}$	500		800	ps
		$T_A = +25^\circ\text{C}$	530	680	830	ps
		$T_A = +85^\circ\text{C}$	580		880	ps
	Propagation Delay SCLK to Q	$T_A = -40^\circ\text{C}$	470		770	ps
		$T_A = 0^\circ\text{C}$	500		800	ps
		$T_A = +25^\circ\text{C}$	530	680	830	ps
		$T_A = +85^\circ\text{C}$	580		880	ps
$t_{skew}$	Part-to-Part Skew <sup>(12)</sup>				200	ps
	Within-Device Skew				50	ps
$t_S$	Setup Time /EN		150			ps
$t_H$	Hold Time /EN		200			ps
$V_{PP}$	Minimum Input Swing, CLK		150			mV
$V_{CMR}$	Common Mode Range <sup>(13)</sup>	$V_{PP} < 500\text{mV}$	$T_A = -40^\circ\text{C}$	$V_{CC} - 2.000$	$V_{CC} - 0.400$	V
			$T_A = 0^\circ\text{C}$ to $+85^\circ\text{C}$	$V_{CC} - 2.100$	$V_{CC} - 0.400$	
		$V_{PP} \geq 500\text{mV}$	$T_A = -40^\circ\text{C}$	$V_{CC} - 1.800$	$V_{CC} - 0.400$	V
			$T_A = 0^\circ\text{C}$ to $+85^\circ\text{C}$	$V_{CC} - 1.900$	$V_{CC} - 0.400$	
$t_r/t_f$	Output Rise/Fall Time Q (20% - 80%)	$T_A = -40^\circ\text{C}$ to $+85^\circ\text{C}$ Typical value at $T_A = +25^\circ\text{C}$	230	360	500	ps
$t_{JITTER}$	Additive Jitter	Carrier = 622MHz Integration Range: 12kHz to 20MHz		70		$\text{fs}_{RMS}$
		Carrier = 156.25MHz Integration Range: 12kHz to 20MHz		155		

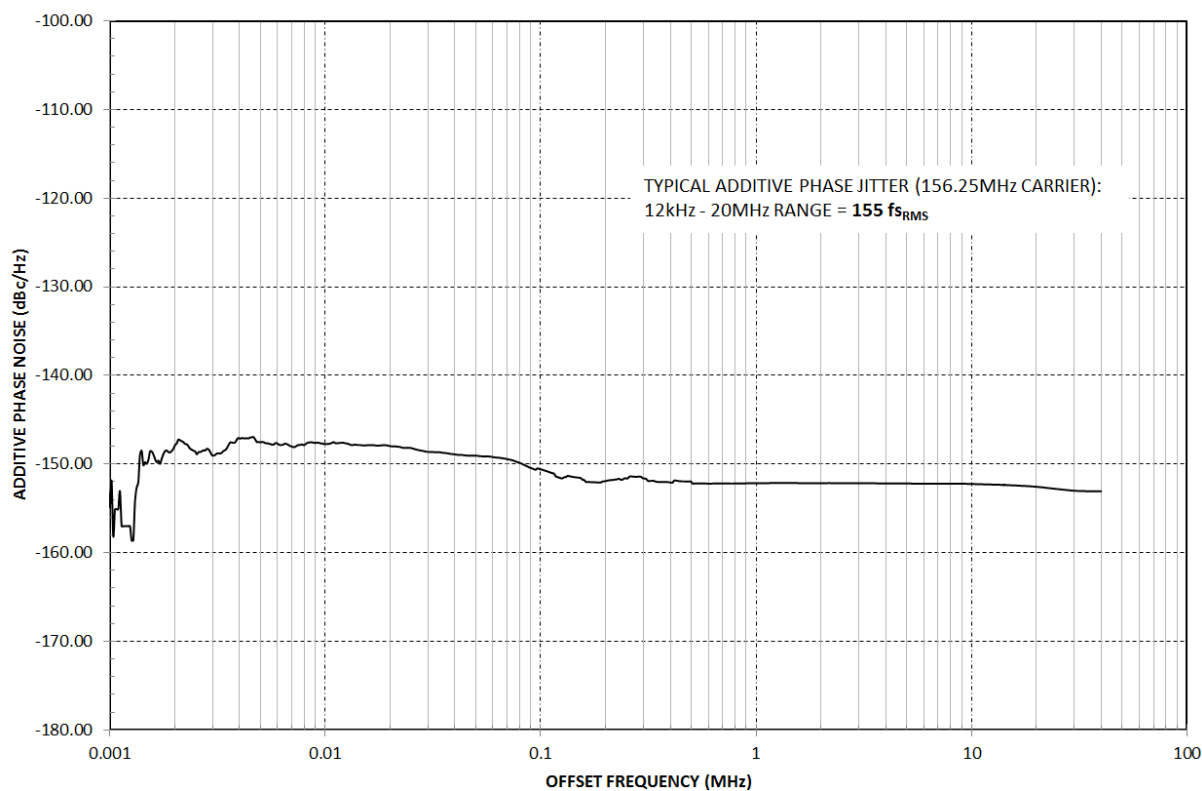
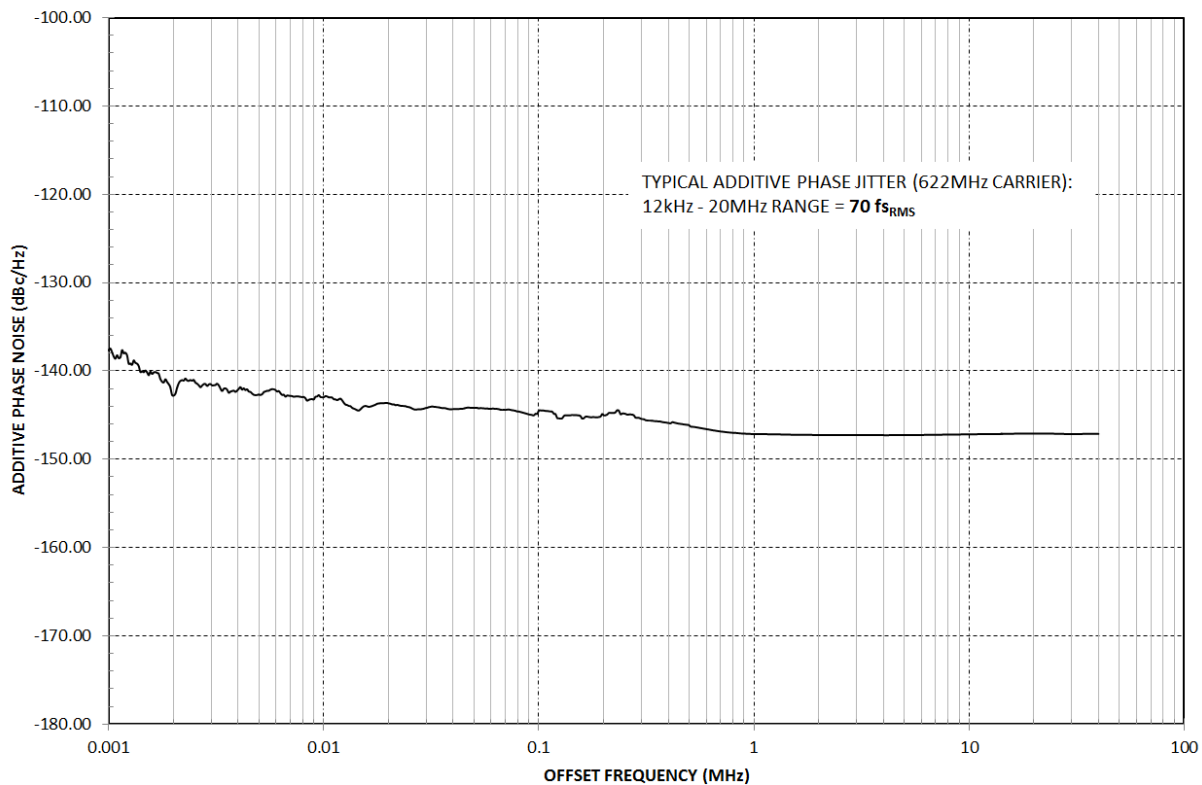
### Notes:

12. Skews are specified for identical LOW-to-HIGH or HIGH-to-LOW transitions.

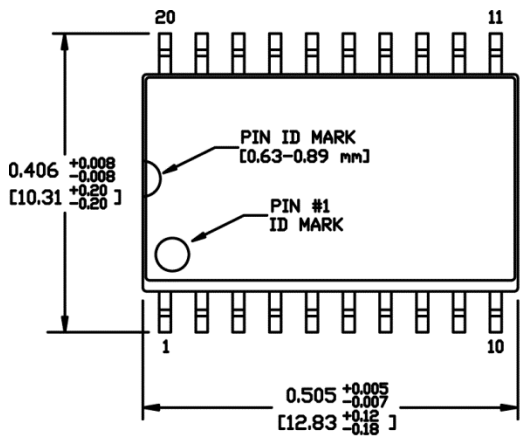
13. The  $V_{CMR}$  range is referenced to the most positive side of the differential input signal. Normal operation is obtained if the HIGH level falls within the specified range and the peak-to-peak voltage lies between  $V_{PP}(\text{min})$  and 1V. The lower end of the  $V_{CMR}$  range varies 1:1 with  $V_{EE}$ . The numbers in the specification table assume a nominal  $V_{EE}$  of 3.3V. For PECL operation, the  $V_{CMR}(\text{min})$  will be fixed at  $3.3\text{V} - |V_{CMR}(\text{min})|$ .

## Additive Phase Noise

$V_{CC} = +5V$ ,  $T_A = 25^\circ$ .

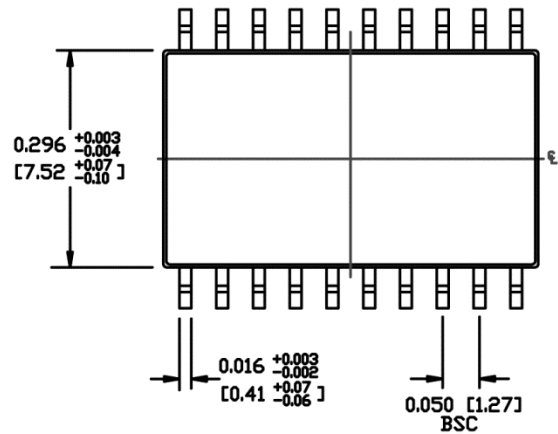


## Package Information<sup>(14)</sup>



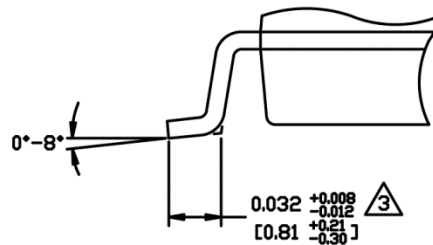
**TOP VIEW**

NOTE: 1, 2

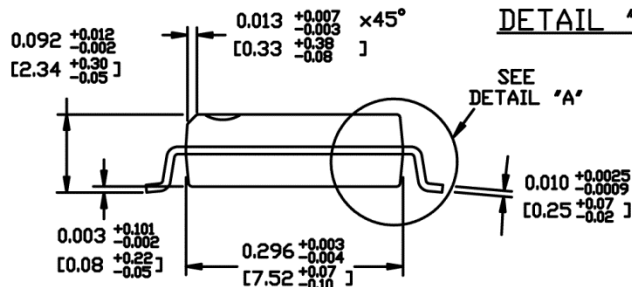


**BOTTOM VIEW**

NOTE: 1, 2

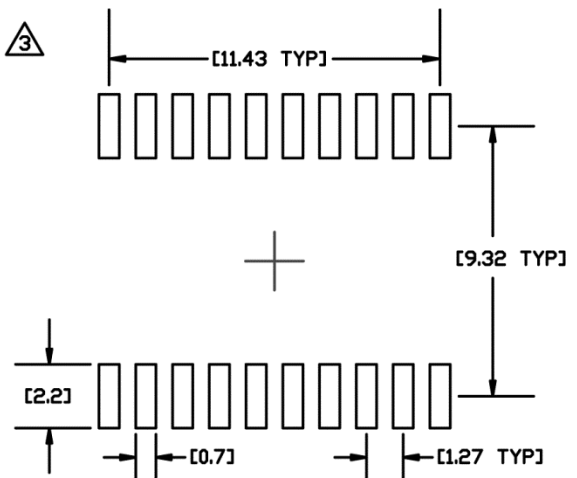


**DETAIL "A"**



**END VIEW**

NOTE: 1, 2, 3



**RECOMMENDED LAND PATTERN**

### NOTES:

1. DIMENSIONS ARE IN INCHES[MM].
2. CONTROLLING DIMENSION: INCHES.
3. DIMENSION DOES NOT INCLUDE MOLD FLASH OR PROTRUSIONS, EITHER OF WHICH SHALL NOT EXCEED 0.006[0.15] PER SIDE.

### 20-Pin Narrow SOIC (Z20-1)

#### Note:

14. Package information is correct as of the publication date. For updates and most current information, go to [www.micrel.com](http://www.micrel.com).

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