



# 5V/3.3V QUAD DIFFERENTIAL RECEIVER

SY100EL17V

## FEATURES

- 3.3V and 5V power supply options
- High bandwidth output transitions
- Internal 75K $\Omega$  input pull down resistors
- Available in 20-pin SOIC package

## DESCRIPTION

The SY100EL17V is a quad differential receiver. The device is functionally equivalent to the E116 device with the capability of operation from either a ECL supply voltage ( $-3.3V$  or  $-5V$ ) or PECL supply voltage ( $+3.3V$  or  $+5V$ ).

The EL17V 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 EL17V as its current sink/source capability is limited. Whenever used, the  $V_{BB}$  pin should be bypassed to ground via a 0.01 $\mu$ f capacitor.

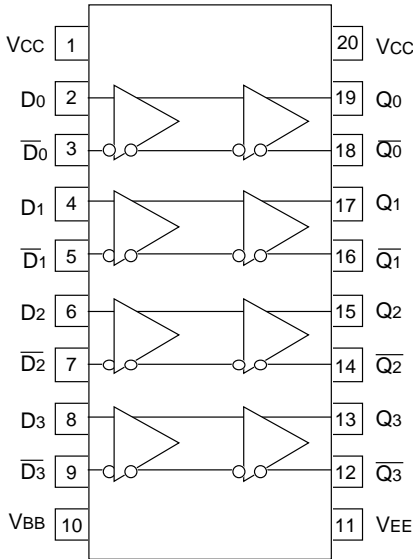
Under open input conditions, the /D input will be biased at  $V_{CC}/2$  and the D input will be pulled down to  $V_{EE}$ . This operation will force the Q output LOW and ensure stability.

## PIN NAMES

Pin	Function
$D_n$	Data Inputs
$Q_n$	Data Outputs
$V_{BB}$	Reference Voltage Output

**PACKAGE/ORDERING INFORMATION**

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



**20-Pin Wide SOIC (Z20-1)**

Part Number	Package Type	Operating Range	Package Marking	Lead Finish
SY100EL17VZC	Z20-1	Commercial	SY100EL17VZC	Sn-Pb
SY100EL17VZCTR <sup>(2)</sup>	Z20-1	Commercial	SY100EL17VZC	Sn-Pb
SY100EL17VZI	Z20-1	Industrial	SY100EL17VZI	Sn-Pb
SY100EL17VZITR <sup>(2)</sup>	Z20-1	Industrial	SY100EL17VZI	Sn-Pb
SY100EL17VZG <sup>(3)</sup>	Z20-1	Industrial	SY100EL17VZG with Pb-Free bar-line indicator	Pb-Free NiPdAu
SY100EL17VZGTR <sup>(2, 3)</sup>	Z20-1	Industrial	SY100EL17VZG with Pb-Free bar-line indicator	Pb-Free NiPdAu

**Notes:**

1. Contact factory for die availability. Dice are guaranteed at  $T_A = 25^\circ\text{C}$ , DC Electricals only.
2. Tape and Reel.
3. Pb-Free package is recommended for new designs.

**ECL/LVECL DC ELECTRICAL CHARACTERISTICS**ECL:  $V_{EE} = -4.2V$  to  $-5.5V$ ;  $V_{CC} = GND$ ; LVECL:  $V_{EE} = -3.0V$  to  $-3.8V$ ;  $V_{CC} = GND$ 

Symbol	Parameter	$T_A = -40^\circ C$			$T_A = 0^\circ C$			$T_A = +25^\circ C$			$T_A = +85^\circ C$			Unit
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
$V_{IH}$	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
$I_{EE}$	Power Supply Current	—	26	31	—	26	31	—	26	31	—	27	33	mA
$I_{IH}$	Input HIGH Current	—	—	150	—	—	150	—	—	150	—	—	150	$\mu A$
$I_{IL}$	Input LOW Current Dn /Dn	0.5 -300	— —	— —	0.5 -300	— —	— —	0.5 -300	— —	— —	0.5 -300	— —	— —	$\mu A$
$V_{BB}$	Output Reference Voltage	-1.38	—	-1.26	-1.38	—	-1.26	-1.38	—	-1.26	-1.38	—	-1.26	V
$V_{OH}$	Output HIGH Voltage	-1085	-1005	-880	-1025	—	-880	-1025	-955	-880	-1025	—	-880	mV
$V_{OL}$	Output LOW Voltage	-1830	-1695	-1555	-1810	—	-1620	-1810	-1705	-1620	-1810	—	-1620	mV

**PECL DC ELECTRICAL CHARACTERISTICS** $V_{CC} = +4.2V$  to  $+5.5V$ ;  $V_{EE} = GND$ 

Symbol	Parameter	$T_A = -40^\circ C$			$T_A = 0^\circ C$			$T_A = +25^\circ C$			$T_A = +85^\circ C$			Unit
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
$V_{IH}$	Input HIGH Voltage <sup>(1)</sup>	3835	—	4120	3835	—	4120	3835	—	4120	3835	—	4120	mV
$V_{IL}$	Input LOW Voltage <sup>(1)</sup>	3190	—	3525	3190	—	3525	3190	—	3525	3190	—	3525	mV
$I_{CC}$	Power Supply Current	—	26	31	—	26	31	—	26	31	—	27	33	mA
$I_{IH}$	Input HIGH Current	—	—	150	—	—	150	—	—	150	—	—	150	$\mu A$
$I_{IL}$	Input LOW Current Dn /Dn	0.5 -300	— —	— —	0.5 -300	— —	— —	0.5 -300	— —	— —	0.5 -300	— —	— —	$\mu A$
$V_{BB}$	Output Reference <sup>(1)</sup> Voltage	3.62	—	3.74	3.62	—	3.74	3.62	—	3.74	3.62	—	3.74	V
$V_{OH}$	Output HIGH Voltage <sup>(1)</sup>	3915	—	4120	3975	—	4120	3975	4050	4120	3975	—	4120	mV
$V_{OL}$	Output LOW Voltage <sup>(1)</sup>	3170	—	3445	3190	—	3380	3190	3300	3380	3190	—	3380	mV

**Note:**1. These levels are for  $V_{CC} = 5.0V$ . Level specifications will vary 1:1 with  $V_{CC}$ .

## LVPECL DC ELECTRICAL CHARACTERISTICS

 $V_{CC} = +3.0V \text{ to } +3.8V; V_{EE} = \text{GND}$ 

Symbol	Parameter	$T_A = -40^\circ\text{C}$			$T_A = 0^\circ\text{C}$			$T_A = +25^\circ\text{C}$			$T_A = +85^\circ\text{C}$			Unit
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
$V_{IH}$	Input HIGH Voltage <sup>(1)</sup>	2135	—	2420	2135	—	2420	2135	2350	2420	2135	—	2420	mV
$V_{IL}$	Input LOW Voltage <sup>(1)</sup>	1490	—	1825	1490	—	1825	1490	—	1825	1490	—	1825	mV
$I_{CC}$	Power Supply Current	—	26	31	—	26	31	—	26	31	—	27	33	mA
$I_{IH}$	Input HIGH Current	—	—	150	—	—	150	—	—	150	—	—	150	$\mu\text{A}$
$I_{IL}$	Input LOW Current Dn /Dn	0.5 -300	— —	— —	0.5 -300	— —	— —	0.5 -300	— —	— —	0.5 -300	— —	— —	$\mu\text{A}$
$V_{BB}$	Output Reference <sup>(1)</sup> Voltage	1.92	—	2.04	1.92	—	2.04	1.92	—	2.04	1.92	—	2.04	V
$V_{OH}$	Output HIGH Voltage <sup>(1)</sup>	2215	—	2420	2275	—	2420	2275	2350	2420	2275	—	2420	mV
$V_{OL}$	Output LOW Voltage <sup>(1)</sup>	1470	—	1745	1490	—	1680	1490	1600	1680	1490	—	1680	mV

**Note:**

1. These levels are for  $V_{CC} = 3.3V$ . Level specifications will vary 1:1 with  $V_{CC}$ .

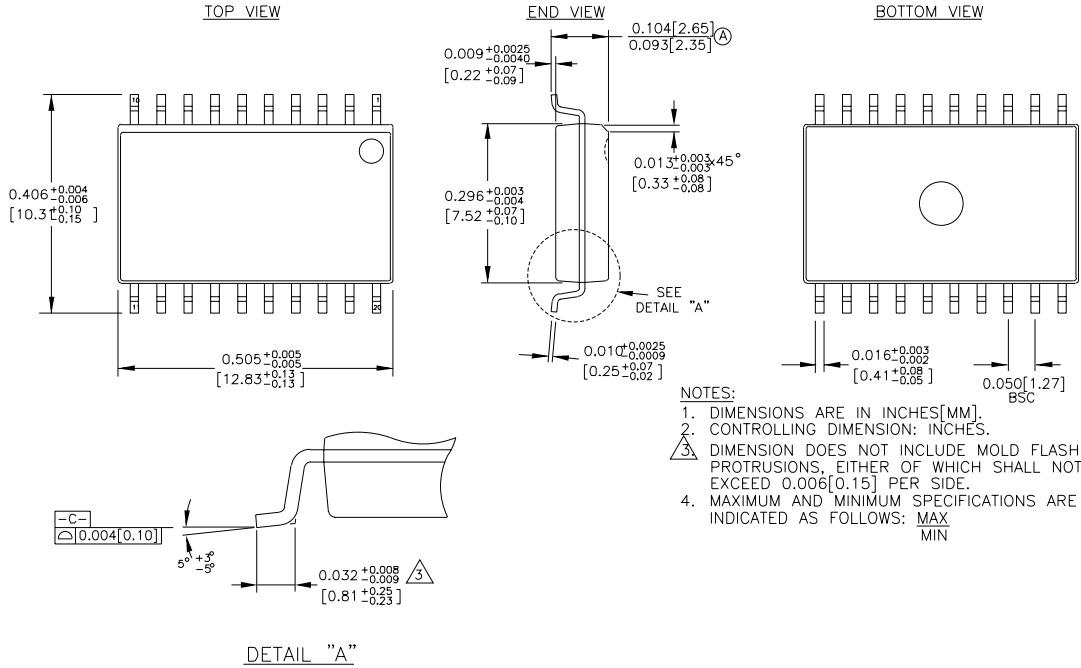
## AC ELECTRICAL CHARACTERISTICS<sup>(1)</sup>

Symbol	Parameter	$T_A = -40^\circ\text{C}$			$T_A = 0^\circ\text{C}$			$T_A = +25^\circ\text{C}$			$T_A = +85^\circ\text{C}$			Unit
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
$t_{PD}$	Propagation Delay D to Q Diff. S.E.	330 280	— —	530 580	340 290	— —	540 590	350 300	— —	550 600	360 310	— —	560 610	ps
$t_{skew}$	Within-Device Skew Output-to-Output <sup>(2)</sup> Part-to-Part (Diff.) <sup>(2)</sup> Duty Cycle (Diff.) <sup>(3)</sup>	— — —	— — —	75 200 25	— — —	— — —	75 200 25	— — —	— — —	75 200 25	— — —	— — —	75 200 25	ps
$V_{PP}$	Minimum Input Swing <sup>(4)</sup>	150	—	—	150	—	—	150	—	—	150	—	—	mV
$V_{CMR}$	Common Mode Range <sup>(5)</sup> ECL/LVECL $V_{PP} < 500\text{mV}$ $V_{PP} \geq 500\text{mV}$ PECL/LVPECL $V_{PP} < 500\text{mV}$ $V_{PP} \geq 500\text{mV}$	$V_{EE}+1.3$ $V_{EE}+1.5$ 1.3 1.5	— — — —	-0.4 -0.4 $V_{CC}-0.4$ $V_{CC}-0.4$	$V_{EE}+1.2$ $V_{EE}+1.4$ 1.2 1.4	— — — —	-0.4 -0.4 $V_{CC}-0.4$ $V_{CC}-0.4$	$V_{EE}+1.2$ $V_{EE}+1.4$ 1.2 1.4	— — — —	-0.4 -0.4 $V_{CC}-0.4$ $V_{CC}-0.4$	$V_{EE}+1.2$ $V_{EE}+1.4$ 1.2 1.4	— — — —	-0.4 -0.4 $V_{CC}-0.4$ $V_{CC}-0.4$	V
$t_r$ $t_f$	Output Rise/Fall Times (20% to 80%)	220	—	420	220	—	420	220	—	420	220	—	420	ps

**Notes:**

1. Power supply requirement applies as indicated in the DC electrical characteristics tables.
2. Skews are valid across specified voltage range.
3. Duty cycle skew is the difference between a  $t_{PLH}$  and  $t_{PHL}$  propagation delay through a device.
4. Minimum input swing for which AC parameters are guaranteed. The device has a DC gain of  $\sim 40$ .
5. The  $V_{CMR}$  is referenced to the most positive side of the differential input signal. Normal operation is obtained if the HIGH levels falls within the specified range and the peak-to-peak voltage lies between  $V_{PP}$  min and 1V.

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



Rev. 03

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