



# 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.

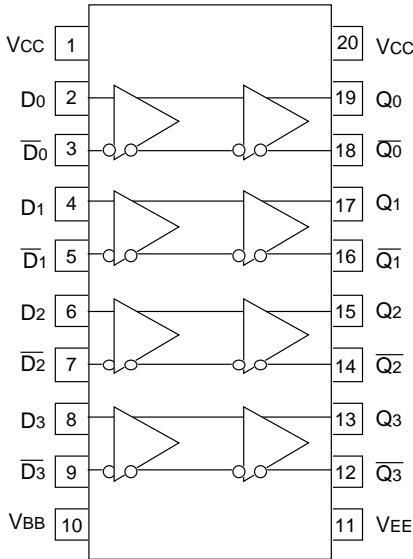
Under open input conditions, the /D input will be biased at  $V_{CC}/2$  and the D input will be pulled down to  $V_{EE}$ . This operation will force the Q output LOW and ensure stability.

## 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<sub>A</sub> = 25°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  $V_{CC}$ .

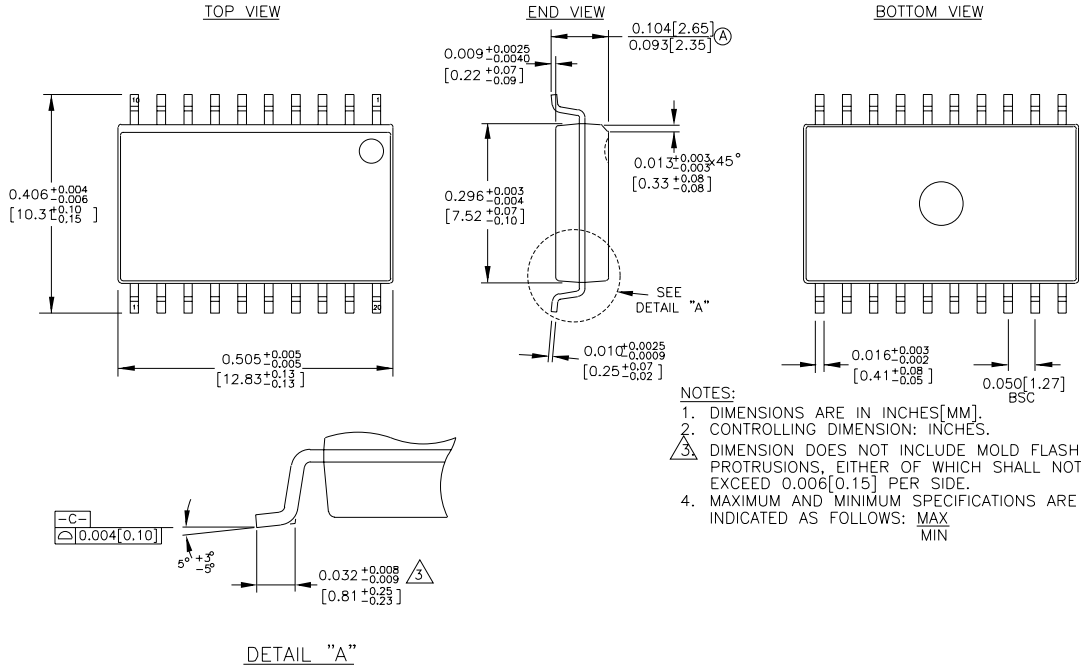
## AC ELECTRICAL CHARACTERISTICS<sup>(1)</sup>

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

**MICREL, INC. 2180 FORTUNE DRIVE SAN JOSE, CA 95131 USA**

TEL + 1 (408) 944-0800 FAX + 1 (408) 474-1000 WEB <http://www.micrel.com>

The information furnished by Micrel in this datasheet is believed to be accurate and reliable. However, no responsibility is assumed by Micrel for its use. Micrel reserves the right to change circuitry and specifications at any time without notification to the customer.

Micrel Products are not designed or authorized for use as components in life support appliances, devices or systems where malfunction of a product can reasonably be expected to result in personal injury. Life support devices or systems are devices or systems that (a) are intended for surgical implant into the body or (b) support or sustain life, and whose failure to perform can be reasonably expected to result in a significant injury to the user. A Purchaser's use or sale of Micrel Products for use in life support appliances, devices or systems is at Purchaser's own risk and Purchaser agrees to fully indemnify Micrel for any damages resulting from such use or sale.

© 2006 Micrel, Incorporated.