

# AZP96

## ECL/PECL Differential Receiver

### FEATURES

- Green and RoHS Compliant / Lead (Pb) Free Package available
- 250ps Propagation Delay
- High Bandwidth Output Transitions
- Operating Range of 3.0V to 5.5V
- Minimized Input Loading
- IBIS Model File Available on Arizona Microtek Website

### PACKAGE AVAILABILITY

PACKAGE	PART NUMBER	MARKING	NOTES
MLP 8 (2x2) Green / RoHS Compliant / Lead (Pb) Free	AZP96NG	Q1G <Date Code>	1,2

- 1 Add R1 at end of part number for 7 inch (1K parts), R2 for 13 inch (2.5K parts) Tape & Reel.
- 2 Date code format: "Y" for year followed by "WW" for week.

### DESCRIPTION

The AZP96 is a differential receiver without the input clamping networks found on similar devices such as the AZ100LVEL16. This makes it especially useful as a buffer when input loading effects must be minimized. Removal of the input clamping network means that the output state will be undefined if both inputs are left open.

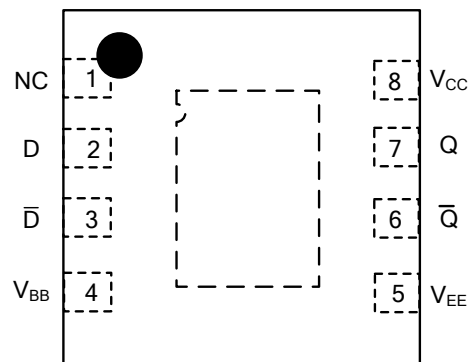
The AZP96 provides a  $V_{BB}$  output for single-ended use or a DC bias reference for AC coupling to the device. For single-ended input applications, the  $V_{BB}$  reference should be connected to one side of the D/ $\bar{D}$  differential input pair. The input signal is then fed to the other D/ $\bar{D}$  input. The  $V_{BB}$  pin can support 1.5 mA sink/source current. When used, the  $V_{BB}$  pin should be bypassed to ground via a 0.01  $\mu$ F capacitor.

NOTE: Specifications in the ECL/PECL/LVPECL tables are valid when thermal equilibrium is established.

### PIN DESCRIPTION

PIN	FUNCTION
D, $\bar{D}$	Data Inputs
Q, $\bar{Q}$	Data Outputs
$V_{BB}$	Reference Voltage Output
$V_{CC}$	Positive Supply
$V_{EE}$	Negative Supply
NC	No Connect

**AZP96N**  
MLP 8, 2x2 mm



**TOP VIEW**

**Bottom Center Pad may be left open or tied to  $V_{EE}$ .**

**Absolute Maximum Ratings are those values beyond which device life may be impaired.**

Symbol	Characteristic	Rating	Unit
V <sub>CC</sub>	PECL Power Supply (V <sub>EE</sub> = 0V)	0 to +8.0	Vdc
V <sub>I</sub>	PECL Input Voltage (V <sub>EE</sub> = 0V)	0 to +6.0	Vdc
V <sub>EE</sub>	ECL Power Supply (V <sub>CC</sub> = 0V)	-8.0 to 0	Vdc
V <sub>I</sub>	ECL Input Voltage (V <sub>CC</sub> = 0V)	-6.0 to 0	Vdc
I <sub>OUT</sub>	Output Current --- Continuous --- Surge	50 100	mA
T <sub>A</sub>	Operating Temperature Range	-40 to +85	°C
T <sub>STG</sub>	Storage Temperature Range	-65 to +150	°C

**100K ECL DC Characteristics (V<sub>EE</sub> = -3.0V to -5.5V, V<sub>CC</sub> = GND)**

Symbol	Characteristic	-40°C			0°C			25°C			85°C			Unit
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
V <sub>OH</sub>	Output HIGH Voltage <sup>1</sup>	-1085	-1005	-880	-1025	-955	-880	-1025	-955	-880	-1025	-955	-880	mV
V <sub>OL</sub>	Output LOW Voltage <sup>1</sup>	-1830	-1695	-1555	-1810	-1705	-1620	-1810	-1705	-1620	-1810	-1705	-1620	mV
V <sub>IH</sub>	Input HIGH Voltage	-1165		-880	-1165		-880	-1165		-880	-1165		-880	mV
V <sub>IL</sub>	Input LOW Voltage	-1810		-1475	-1810		-1475	-1810		-1475	-1810		-1475	mV
V <sub>BB</sub>	Reference Voltage	-1380		-1260	-1380		-1260	-1380		-1260	-1380		-1260	mV
I <sub>IL</sub>	Input LOW Current	0.5			0.5			0.5			0.5			μA
I <sub>IH</sub>	Input HIGH Current			50			50			50			50	μA
I <sub>EE</sub>	Power Supply Current		18	22		18	22		18	22		18	24	mA

- Each output is terminated through a 50Ω resistor to V<sub>CC</sub> - 2V.

**100K LVPECL DC Characteristics (V<sub>EE</sub> = GND, V<sub>CC</sub> = +3.3V)**

Symbol	Characteristic	-40°C			0°C			25°C			85°C			Unit
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
V <sub>OH</sub>	Output HIGH Voltage <sup>1,2</sup>	2215	2295	2420	2275	2345	2420	2275	2345	2420	2275	2345	2420	mV
V <sub>OL</sub>	Output LOW Voltage <sup>1,2</sup>	1470	1605	1745	1490	1595	1680	1490	1595	1680	1490	1595	1680	mV
V <sub>IH</sub>	Input HIGH Voltage <sup>1</sup>	2135		2420	2135		2420	2135		2420	2135		2420	mV
V <sub>IL</sub>	Input LOW Voltage <sup>1</sup>	1490		1825	1490		1825	1490		1825	1490		1825	mV
V <sub>BB</sub>	Reference Voltage <sup>1</sup>	1920		2040	1920		2040	1920		2040	1920		2040	mV
I <sub>IL</sub>	Input LOW Current	0.5			0.5			0.5			0.5			μA
I <sub>IH</sub>	Input HIGH Current			50			50			50			50	μA
I <sub>EE</sub>	Power Supply Current		18	22		18	22		18	22		18	24	mA

- For supply voltages other than 3.3V, use the ECL table values and ADD supply voltage value.
- Each output is terminated through a 50Ω resistor to V<sub>CC</sub> - 2V.

**100K PECL DC Characteristics (V<sub>EE</sub> = GND, V<sub>CC</sub> = +5.0V)**

Symbol	Characteristic	-40°C			0°C			25°C			85°C			Unit
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
V <sub>OH</sub>	Output HIGH Voltage <sup>1,2</sup>	3915	3995	4120	3975	4045	4120	3975	4045	4120	3975	4045	4120	mV
V <sub>OL</sub>	Output LOW Voltage <sup>1,2</sup>	3170	3305	3445	3190	3295	3380	3190	3295	3380	3190	3295	3380	mV
V <sub>IH</sub>	Input HIGH Voltage <sup>1</sup>	3835		4120	3835		4120	3835		4120	3835		4120	mV
V <sub>IL</sub>	Input LOW Voltage <sup>1</sup>	3190		3525	3190		3525	3190		3525	3190		3525	mV
V <sub>BB</sub>	Reference Voltage <sup>1</sup>	3620		3740	3620		3740	3620		3740	3620		3740	mV
I <sub>IL</sub>	Input LOW Current	0.5			0.5			0.5			0.5			μA
I <sub>IH</sub>	Input HIGH Current			50			50			50			50	μA
I <sub>EE</sub>	Power Supply Current		18	22		18	22		18	22		18	24	mA

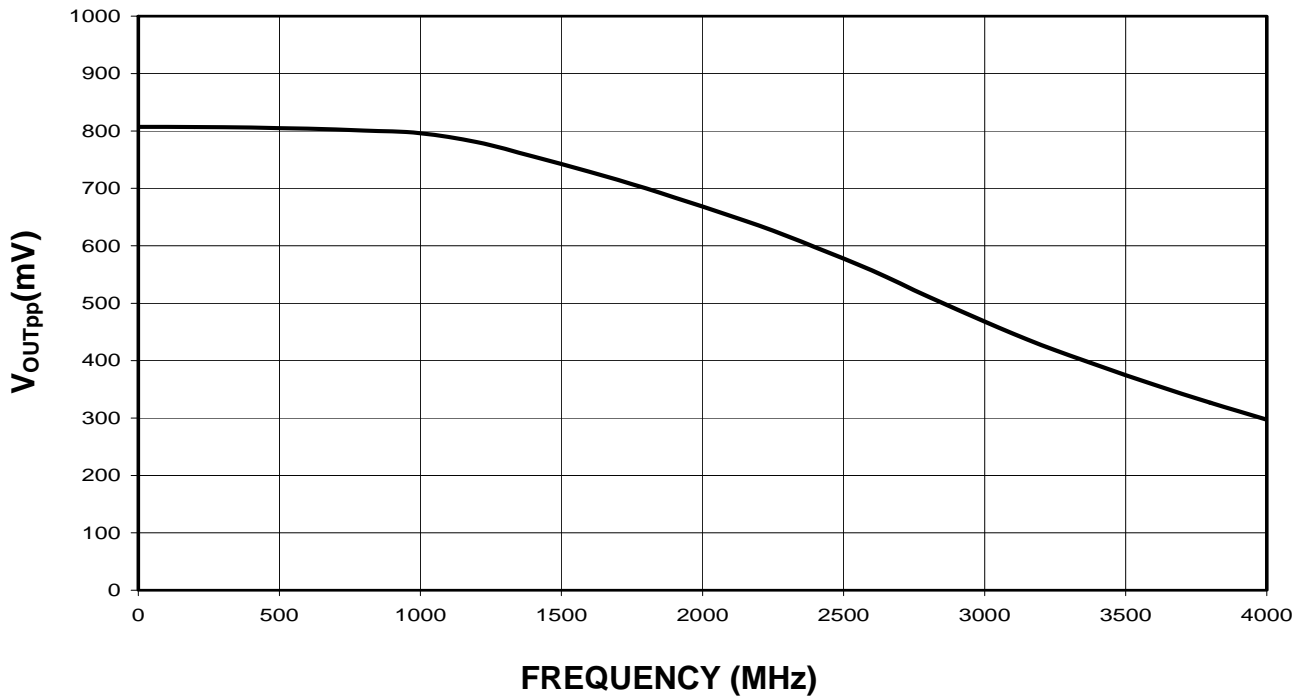
- For supply voltages other than 5.0V, use the ECL table values and ADD supply voltage value.
- Each output is terminated through a 50Ω resistor to V<sub>CC</sub> - 2V.

**AC Characteristics** ( $V_{EE} = -3.0V$  to  $-5.5V$ ;  $V_{CC} = GND$  or  $V_{EE} = GND$ ;  $V_{CC} = +3.0V$  to  $+5.5V$ )

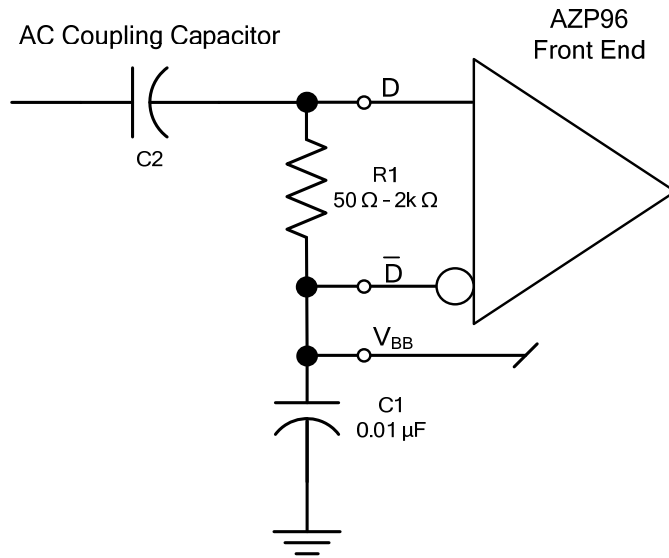
Symbol	Characteristic	-40°C			0°C			25°C			85°C			Unit
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
$t_{PLH} / t_{PHL}$	Propagation Delay to Output (Diff) (SE)	125	250	375	175	250	325	175	250	325	205	280	355	ps
$t_{SKEW}$	Duty Cycle Skew <sup>1</sup> (Diff)		5			5	20		5	20		5	20	ps
$V_{PP}(AC)$	Minimum Input Swing <sup>2</sup>	150			150			150			150			mV
$V_{CMR}$	Common Mode Range <sup>3</sup>	$V_{EE} +$		$V_{CC} -$	$V_{EE} +$		$V_{CC} -$	$V_{EE} +$		$V_{CC} -$	$V_{EE} +$		$V_{CC} -$	V
	$V_{PP} < 500mV$	1.2		0.4	1.1		0.4	1.1		0.4	1.1		0.4	
	$V_{PP} \geq 500mV$	1.5		0.4	1.4		0.4	1.4		0.4	1.4		0.4	
$t_r / t_f$	Output Rise/Fall Times Q (20% - 80%)	100		260	100		260	100		260	100		260	ps

1. Duty cycle skew is the difference between a  $t_{PLH}$  and  $t_{PHL}$  propagation delay through a device.
2.  $V_{PP}$  is the minimum peak-to-peak differential input swing for which AC parameters are guaranteed. The device has a DC gain of  $\approx 40$ .
3. 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.

**Typical Large Signal Outputs, Q/Q**

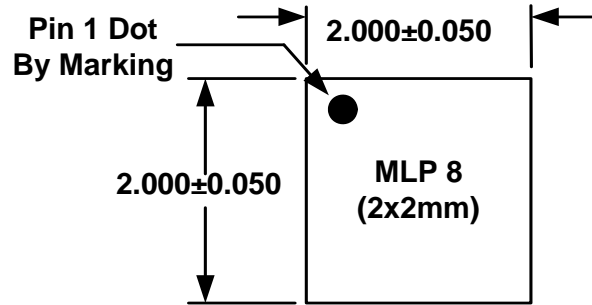


Measured with 750mv differential (D/ $\bar{D}$ ) input, Q/ $\bar{Q}$  each terminated to  $V_{CC}-2V$  via 50  $\Omega$  resistors.

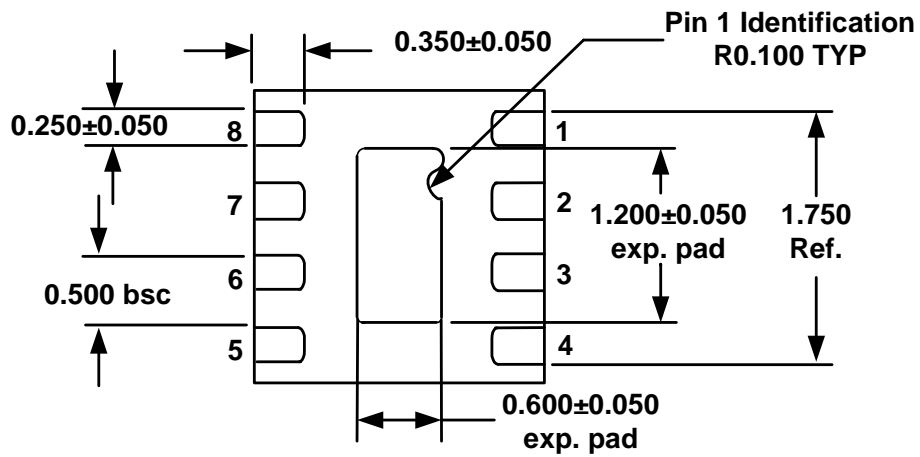


**Recommended Circuit for Single-Ended Input Limiting Applications**

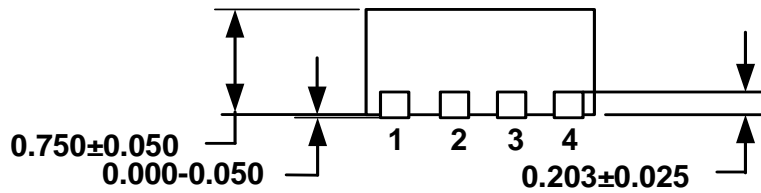
**PACKAGE DIAGRAM**  
**MLP 8 2x2mm**



TOP VIEW



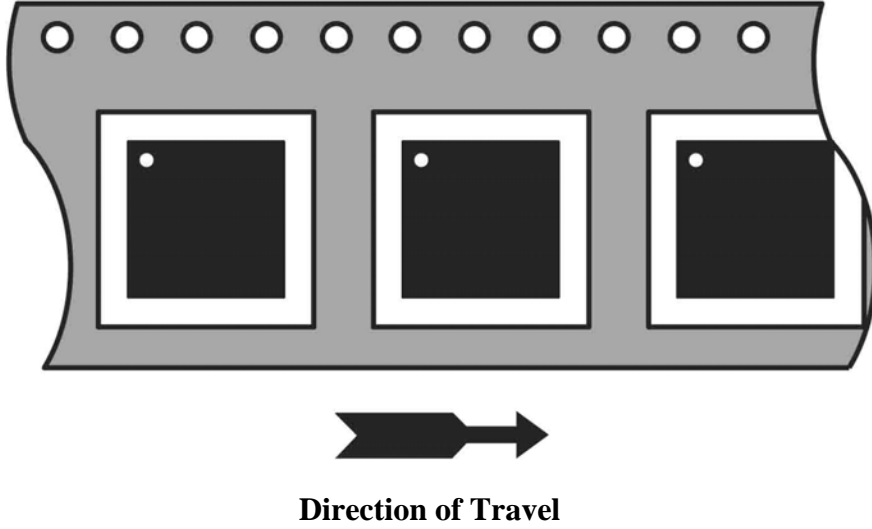
BOTTOM VIEW



SIDE VIEW

**Note: All dimensions are in mm**

**TAPE & REEL PACKAGING**  
**MLP 8 2x2mm**



<b>Package</b>	<b>Suffix</b>	<b>Reel Diameter</b>	<b>Quantity</b>	<b>Carrier Tape Width</b>	<b>Carrier Tape Pitch</b>
MLP 8 (2x2mm)	R1	7"	1000	8mm	4mm
	R2	13"	2500	8mm	4mm

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