

AZ10/100EP16

LVPECL Differential Receiver

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FEATURES

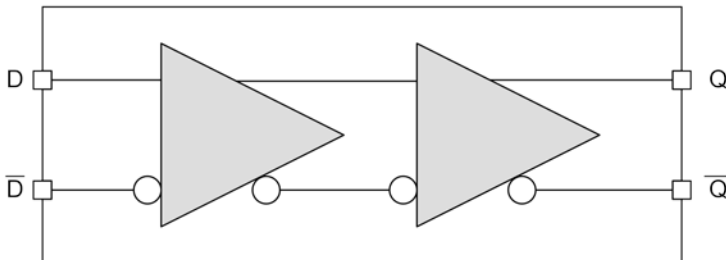
- Silicon-Germanium for high-speed operation
- 150ps typical propagation delay
- Internal pull-down resistors

DESCRIPTION

The [AZ10/100EP16](#) is a Silicon-Germanium (SiGe) differential receiver. The device is functionally equivalent to the AZ10EL16 device with higher performance capabilities. With output transition times significantly faster than the AZ10/100EL16, the AZ10/100EP16 is ideally suited for interfacing with high frequency sources.

The AZ10/100EP16 is functionally equivalent to the ON Semi MC10EP16 & MC100EP16

BLOCK DIAGRAM



APPLICATIONS

- Interfacing with very high frequency sources

PACKAGE AVAILABILITY

- MSOP8
 - Green/RoHS Compliant/Pb-Free

Order Number	Package	Marking
AZ10EP16T ¹	MSOP8	AZTEP16 ²
AZ100EP16T ¹	MSOP8	AZHEP16 ²

¹ [Tape & Reel](#) - Add 'R1' at end of order number for 7in (1k parts), 'R2' (2.5k) for 13in

² See www.azmicrotek.com for [date code format](#)

PIN DESCRIPTION AND CONFIGURATION

Table 1 - Pin Description

Pin	Name	Type	Function
1	NC		
2	D	Input	Data Input
3	\overline{D}	Input	Data Input
4	V_{BB}	Output	Reference Voltage Output
5	V_{EE}	Power	Negative Supply
6	\overline{Q}	Output	Data Output
7	Q	Output	Data Output
8	V_{CC}	Power	Positive Supply

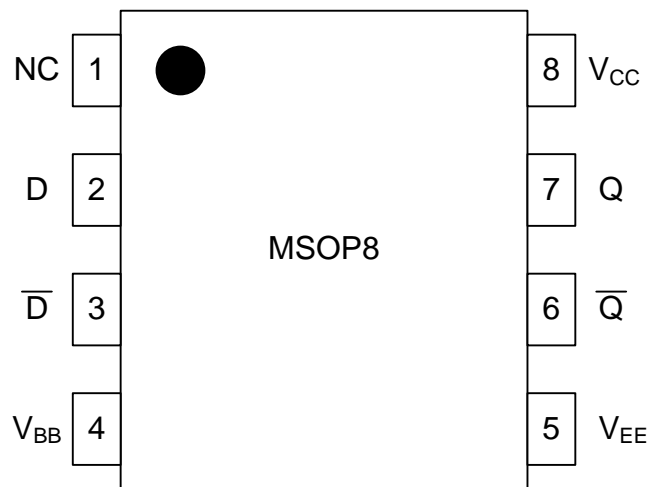


Figure 1 - Pin Configuration for MSOP8

ENGINEERING NOTES

The AZ10/100EP16 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/D differential input pair. The input signal is then fed to the other D/D input. The V_{BB} pin can support 1.5mA sink/source current. When used, the V_{BB} pin should be bypassed to ground via a $0.01\mu\text{F}$ capacitor.

Under open input conditions internal input clamps will force the Q output LOW.

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

Large Signal Performance*

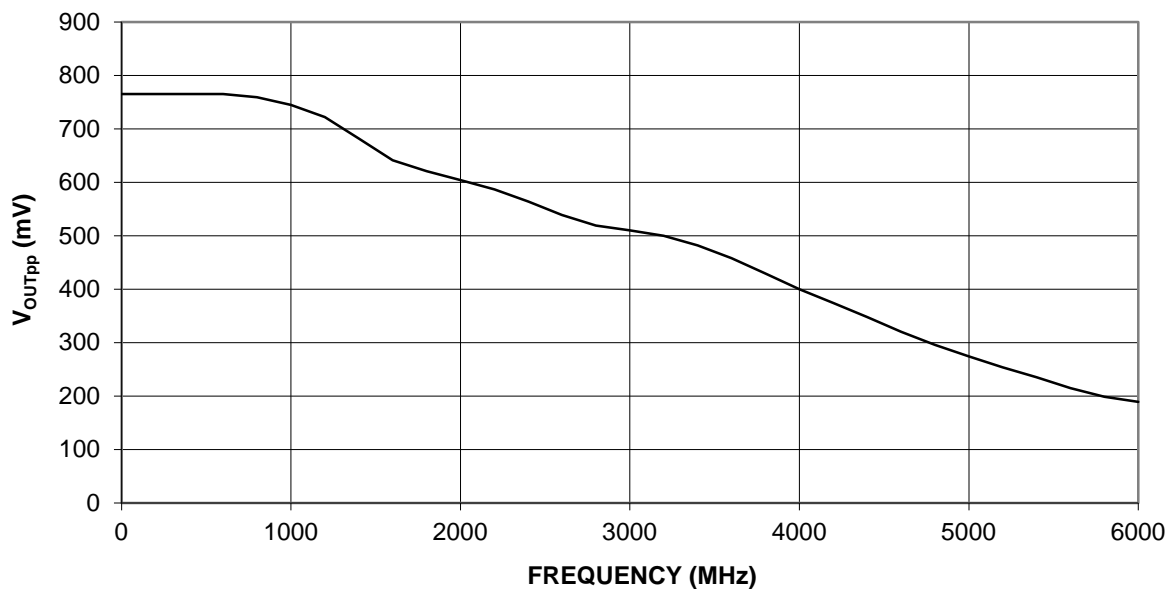


Figure 2 - AZ10/100EP16 Large Signal Performance

*Measured using a 750mV differential input source at 50% duty cycle.

PERFORMANCE DATA**Table 2 – Absolute Maximum Ratings****Absolute Maximum Ratings are those values beyond which device life may be impaired.**

Symbol	Characteristic	Condition	Rating	Unit
V _{CC}	PECL Power Supply	V _{EE} = 0V	0 to +4.5	V
V _I	PECL Input Voltage	V _{EE} = 0V	0 to +4.5	V
V _{EE}	ECL Power Supply	V _{CC} = 0V	-4.5 to 0	V
V _I	ECL Input Voltage	V _{CC} = 0V	-4.5 to 0	V
I _{OUT}	Output Current	Continuous	50	mA
		Surge	100	
T _A	Operating Temperature Range		-40 to +85	°C
T _{STG}	Storage Temperature Range		-65 to +150	°C
ESD _{HBM}	Human Body Model		2500	V
ESD _{MM}	Machine Model		200	V
ESD _{CDM}	Charged Device Model		2500	V

Table 3 - 10K ECL DC Characteristics**10K ECL DC Characteristics (V_{EE} = -3.0V to -3.6V, V_{CC} = 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 _{OH}	Output HIGH Voltage ¹	-1135		-885				-1070	-945	-820	-1010		-760	mV
V _{OL}	Output LOW Voltage ¹	-1935		-1685				-1870	-1745	-1620	-1810		-1560	mV
V _{IH}	Input HIGH Voltage	-1200		-885				-1150		-820	-1090		-760	mV
V _{IL}	Input LOW Voltage	-1935		-1530				-1870		-1450	-1810		-1410	mV
V _{BB}	Reference Voltage	-1430		-1300	-1380		-1270	-1350		-1250	-1310		-1190	mV
I _{IH}	Input HIGH Current			175			175			175			175	V
I _{IL}	Input LOW Current - D	0.5			0.5			0.5			0.5			μA
	Input LOW Current - Db	-150			-150			-150			-150			μA
I _{EE}	Power Supply Current	20	25	33	21	26	34	21	27	35	23	29	37	mA

¹ Each output is terminated through a 50Ω resistor to V_{CC} -2V

Table 4 – 10K PECL DC Characteristics

10K PECL DC Characteristics ($V_{EE} = \text{GND}$, $V_{CC} = +3.3\text{V}$)

Symbol	Characteristic	-40 °C			0 °C			25 °C			85 °C			Unit
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
V_{OH}	Output HIGH Voltage ¹	2165		2415				2230	2355	2480	2290		2540	mV
V_{OL}	Output LOW Voltage ¹	1365		1615				1430	1555	1680	1490		1740	mV
V_{IH}	Input HIGH Voltage	2100		2415				2035		2480	2210		2540	mV
V_{IL}	Input LOW Voltage	1365		1770				1430		1850	1490		1890	mV
V_{BB}	Reference Voltage	1870		2000	1920		2030	1950		2050	1990		2110	mV
I_{IH}	Input HIGH Current			175			175			175			175	V
I_{IL}	Input LOW Current - D	0.5			0.5			0.5			0.5			μA
	Input LOW Current - Db	-150			-150			-150			-150			μA
I_{EE}	Power Supply Current	20	25	33	21	26	34	21	27	35	23	29	37	mA

¹ Each output is terminated through a 50Ω resistor to $V_{CC} - 2\text{V}$

Table 5 – 100K ECL DC Characteristics

100K ECL DC Characteristics ($V_{EE} = -3.0\text{V to } -3.6\text{V}$, $V_{CC} = \text{GND}$)

Symbol	Characteristic	-40 °C			0 °C			25 °C			85 °C			Unit
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
V_{OH}	Output HIGH Voltage ¹	-1085		-880	-1025		-880	-1025	-955	-880	-1025		-880	mV
V_{OL}	Output LOW Voltage ¹	-1830		-1555	-1810		-1620	-1810	-1705	-1620	-1810		-1620	mV
V_{IH}	Input HIGH Voltage	-1220		-880	-1160		-880	-1160		-880	-1160		-880	mV
V_{IL}	Input LOW Voltage	-1830		-1540	-1810		-1480	-1810		-1480	-1810		-1480	mV
V_{BB}	Reference Voltage	-1440		-1320	-1380		-1260	-1380		-1260	-1380		-1260	mV
I_{IH}	Input HIGH Current			175			175			175			175	V
I_{IL}	Input LOW Current - D	0.5			0.5			0.5			0.5			μA
	Input LOW Current - Db	-150			-150			-150			-150			μA
I_{EE}	Power Supply Current	19	24	32	20	25	33	21	26	35	23	29	38	mA

¹ Each output is terminated through a 50Ω resistor to $V_{CC} - 2\text{V}$

Table 6 - 100K PECL DC Characteristics

100K PECL DC Characteristics ($V_{EE} = \text{GND}$, $V_{CC} = +3.3\text{V}$)

Symbol	Characteristic	-40 °C			0 °C			25 °C			85 °C			Unit
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
V_{OH}	Output HIGH Voltage ¹	2215		2420	2275		2420	2275	2345	2420	2275		2420	mV
V_{OL}	Output LOW Voltage ¹	1470		1745	1490		1680	1490	1595	1680	1490		1680	mV
V_{IH}	Input HIGH Voltage	2080		2420	2140		2420	2140		2420	2140		2420	mV
V_{IL}	Input LOW Voltage	1470		1760	1490		1820	1490		1820	1490		1820	mV
V_{BB}	Reference Voltage	1860		1980	1920		2040	1920		2040	1920		2040	mV
I_{IH}	Input HIGH Current			175			175			175			175	V
I_{IL}	Input LOW Current - D	0.5			0.5			0.5			0.5			μA
	Input LOW Current - Db	-150			-150			-150			-150			μA
I_{EE}	Power Supply Current	19	24	32	20	25	33	21	26	35	23	29	38	mA

¹ Each output is terminated through a 50Ω resistor to $V_{CC} - 2\text{V}$

Table 7 - AC Characteristics

AC Characteristics ($V_{EE} = -3.0\text{V}$ to -3.6V , $V_{CC} = \text{GND}$ or $V_{EE} = \text{GND}$, $V_{CC} = +3.0\text{V}$ to $+3.6\text{V}$)

Symbol	Characteristic	-40 °C			0 °C			25 °C			85 °C			Unit
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
f_{max}	Max Toggle Frequency ⁴		>4			>4			>4			>4		GHz
$t_{\text{PLH}}/t_{\text{PHL}}$	Propagation Delay to Output	100	160	240	100	160	240	100	160	240	120	190	280	ps
t_{skew}	Duty Cycle Skew ¹		5			5	20		5	20		5	20	ps
$V_{\text{PP}}(\text{AC})$	Minimum Input Swing ²	150			150			150			150			mV
V_{CMR}	Common Mode Range ⁴	$V_{EE} + 2.0$		V_{CC}	$V_{EE} + 2.0$		V_{CC}	$V_{EE} + 2.0$		V_{CC}	$V_{EE} + 2.0$		V_{CC}	V
t_r/t_f	Output Rise/Fall Times Q (20%-80%)		120	170		130	180		130	180		150	200	ps

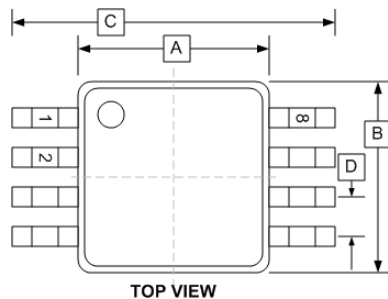
¹ Duty cycle skew is the difference between a t_{PLH} and t_{PHL} propagation delay through a device.

² V_{PP} is the minimum peak-to-peak differential input swing for which AC parameters guaranteed. The device has a DC gain of 40.

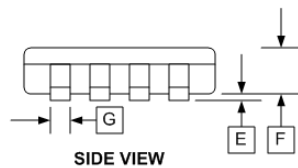
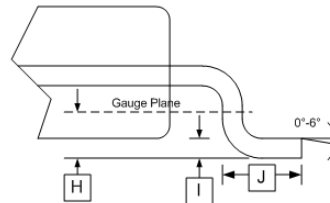
³ The V_{CMR} range is referenced to the most positive side of the differential input signal. Normal operation is obtained if the HIGH level falls within the specified range and the peak-to-peak voltage lies between V_{PP} (min) and 1V.

⁴ See Figure 2

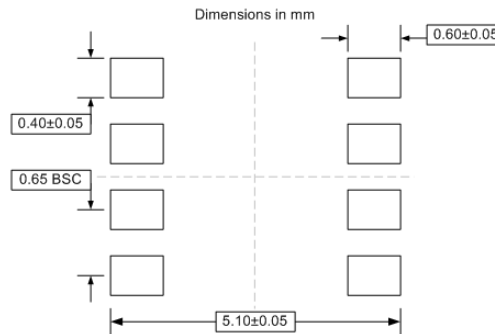
PACKAGE DIAGRAM
MSOP8
 Green/RoHS compliant/Pb-Free
 MSL=1



MSOP8 (T)



PCB LAND PATTERN/FOOTPRINT



DIM	INCHES	
	MIN	MAX
A	0.118±0.004	
B	0.118±0.004	
C	0.192±0.008	
D	0.0256 TYP	
E	0.004±0.002	
F	0.034±0.002	
G	0.009±0.014	
H	0.010	
I	0.006±0.002	
J	0.021±0.004	

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