AZ10/100EP16

www.azmicrotek.com

LVPECL Differential Receiver

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

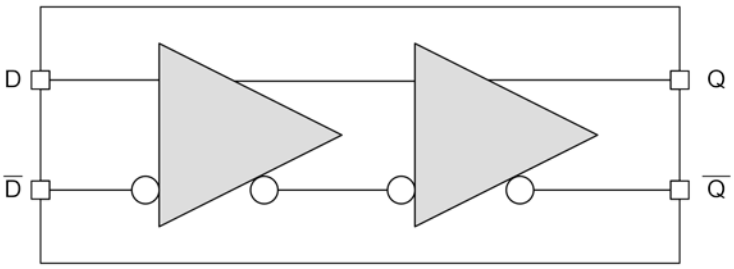
FEATURES

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

APPLICATIONS

- Interfacing with very high frequency sources

BLOCK DIAGRAM



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

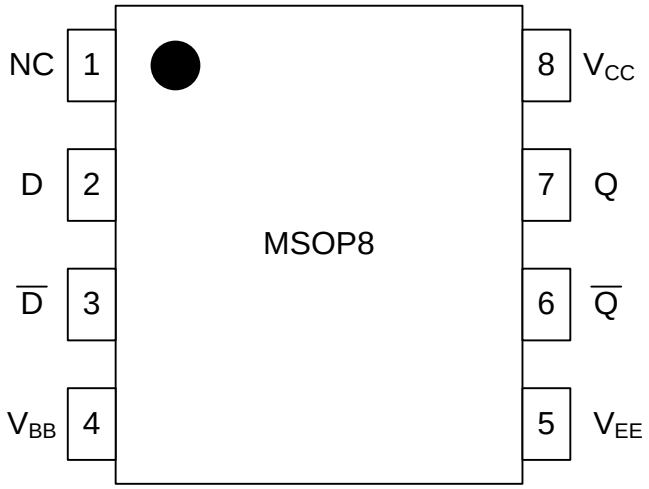


Figure 1 - Pin Configuration for MSOP8

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/$\overline{D}$ differential input pair. The input signal is then fed to the other D/$\overline{D}$ 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 0.01µF 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.

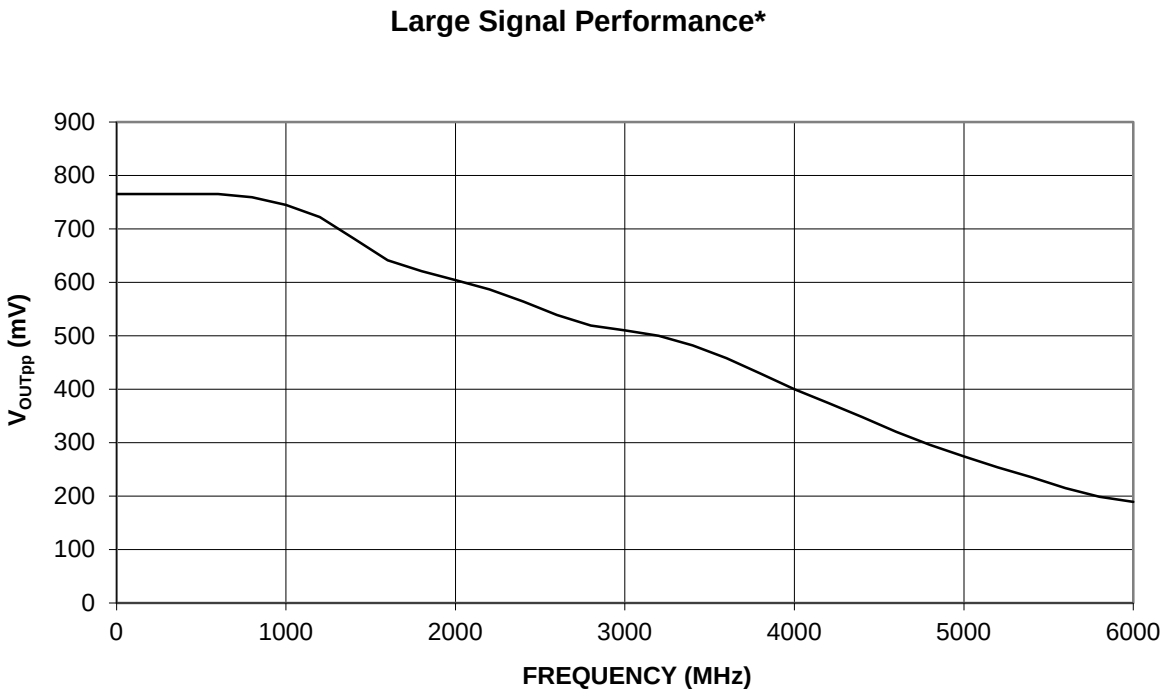


Figure 2 - AZ10/100EP16 Large Signal Performance

*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} = GND, V_{CC} = +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_{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} -2V

Table 5 – 100K ECL DC Characteristics

100K 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]	-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} -2V

Table 6 - 100K PECL DC Characteristics

100K PECL DC Characteristics (V_{EE} = GND, V_{CC} = +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_{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} -2V

Table 7 - AC Characteristics

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

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_{PLH}/t_{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_{PP}(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.

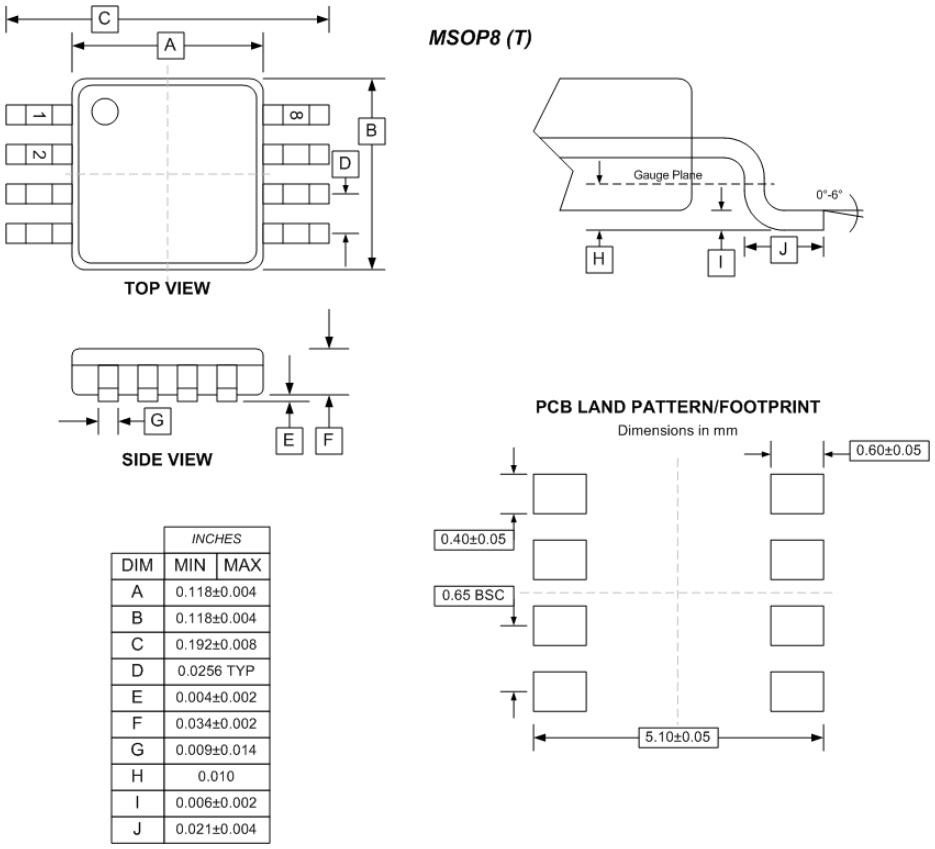
[2] V_{PP} is the minimum peak-to-peak differential input swing for which AC parameters guaranteed. The device has a DC gain of 40.

[3] The VCMR 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



	INCHES	
DIM	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	