

AZ10EP16 AZ100EP16

ECL/PECL Differential Receiver

FEATURES

- Silicon-Germanium for High Speed Operation
- 150ps Typical Propagation Delay
- Internal Input Pulldown Resistors
- Functionally Equivalent to ON Semiconductor MC10EP16 & MC100EP16

PACKAGE AVAILABILITY

PACKAGE	PART NO.	MARKING
SOIC 8	AZ10EP16D	AZM10EP16
SOIC 8 T&R	AZ10EP16DR1	AZM10EP16
SOIC 8 T&R	AZ10EP16DR2	AZM10EP16
SOIC 8	AZ100EP16D	AZM100EP16
SOIC 8 T&R	AZ100EP16DR1	AZM100EP16
SOIC 8 T&R	AZ100EP16DR2	AZM100EP16
TSSOP 8	AZ10EP16T	AZTEP16
TSSOP 8 T&R	AZ10EP16TR1	AZTEP16
TSSOP 8 T&R	AZ10EP16TR2	AZTEP16
TSSOP 8	AZ100EP16T	AZHEP16
TSSOP 8 T&R	AZ100EP16TR1	AZHEP16
TSSOP 8 T&R	AZ100EP16TR2	AZHEP16

DESCRIPTION

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

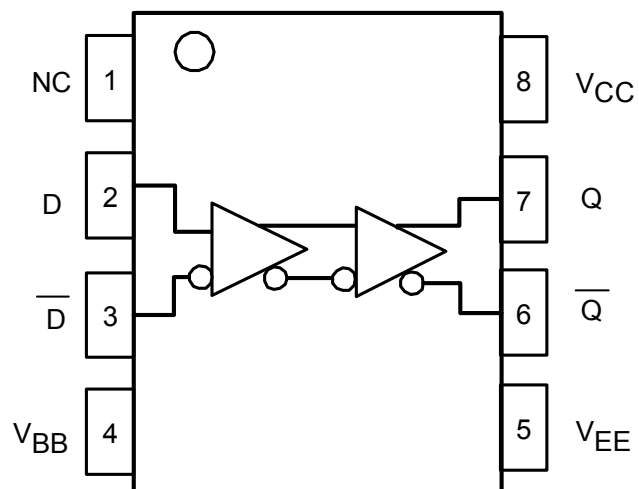
The EP16 provides a V_{BB} output for single-ended use or a DC bias reference for AC coupling to the device. For single-ended input applications, the V_{BB} reference should be connected to one side of the D/ $\bar{D}$ differential input pair. The input signal is then fed to the other D/ $\bar{D}$ input. The V_{BB} pin can support 1.5mA sink/source current. When used, the V_{BB} pin should be bypassed to ground via a 0.01 μ 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.

LOGIC DIAGRAM AND PINOUT ASSIGNMENT

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



AZ10EP16

AZ100EP16

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

Symbol	Characteristic	Rating	Unit
V_{CC}	PECL Power Supply ($V_{EE} = 0V$)	0 to +4.5	Vdc
V_I	PECL Input Voltage ($V_{EE} = 0V$)	0 to +4.5	Vdc
V_{EE}	ECL Power Supply ($V_{CC} = 0V$)	-4.5 to 0	Vdc
V_I	ECL Input Voltage ($V_{CC} = 0V$)	-4.5 to 0	Vdc
I_{OUT}	Output Current --- Continuous --- Surge	50 100	mA
T_A	Operating Temperature Range	-40 to +85	°C
T_{STG}	Storage Temperature Range	-65 to +150	°C

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	μA
I_{IL}	Input LOW Current													μA
	D	0.5			0.5			0.5			0.5			μA
	$\bar{D}$	-150			-150			-150			-150			μA
I_{EE}	Power Supply Current	20	25	33	21	26	34	21	27	35	23	29	37	mA

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

10K LVPECL 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 ^{1,2}	2165		2415				2230	2355	2480	2290		2540	mV
V_{OL}	Output LOW Voltage ^{1,2}	1365		1615				1430	1555	1680	1490		1740	mV
V_{IH}	Input HIGH Voltage ¹	2100		2415				2035		2480	2210		2540	mV
V_{IL}	Input LOW Voltage ¹	1365		1770				1430		1850	1490		1890	mV
V_{BB}	Reference Voltage ¹	1870		2000	1920		2030	1950		2050	1990		2110	mV
I_{IH}	Input HIGH Current			175			175			175			175	μA
I_{IL}	Input LOW Current													μA
	D	0.5			0.5			0.5			0.5			μA
	$\bar{D}$	-150			-150			-150			-150			μA
I_{EE}	Power Supply Current	20	25	33	21	26	34	21	27	35	23	29	37	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 $V_{CC} - 2V$.

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	μA
I_{IL}	Input LOW Current													μA
	D	0.5			0.5			0.5			0.5			μA
	$\bar{D}$	-150			-150			-150			-150			μA
I_{EE}	Power Supply Current	19	24	32	20	25	33	21	26	35	23	29	38	mA

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

AZ10EP16

AZ100EP16

100K LVPECL 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 ^{1,2}	2215		2420	2275		2420	2275	2345	2420	2275		2420	mV
V_{OL}	Output LOW Voltage ^{1,2}	1470		1745	1490		1680	1490	1595	1680	1490		1680	mV
V_{IH}	Input HIGH Voltage ¹	2080		2420	2140		2420	2140		2420	2140		2420	mV
V_{IL}	Input LOW Voltage ¹	1470		1760	1490		1820	1490		1820	1490		1820	mV
V_{BB}	Reference Voltage ¹	1860		1980	1920		2040	1920		2040	1920		2040	mV
I_{IH}	Input HIGH Current			175			175			175			175	μA
I_{IL}	Input LOW Current													μA
		D	0.5		0.5			0.5			0.5			μA
		D	-150		-150			-150			-150			μA
I_{EE}	Power Supply Current	19	24	32	20	25	33	21	26	35	23	29	38	mA

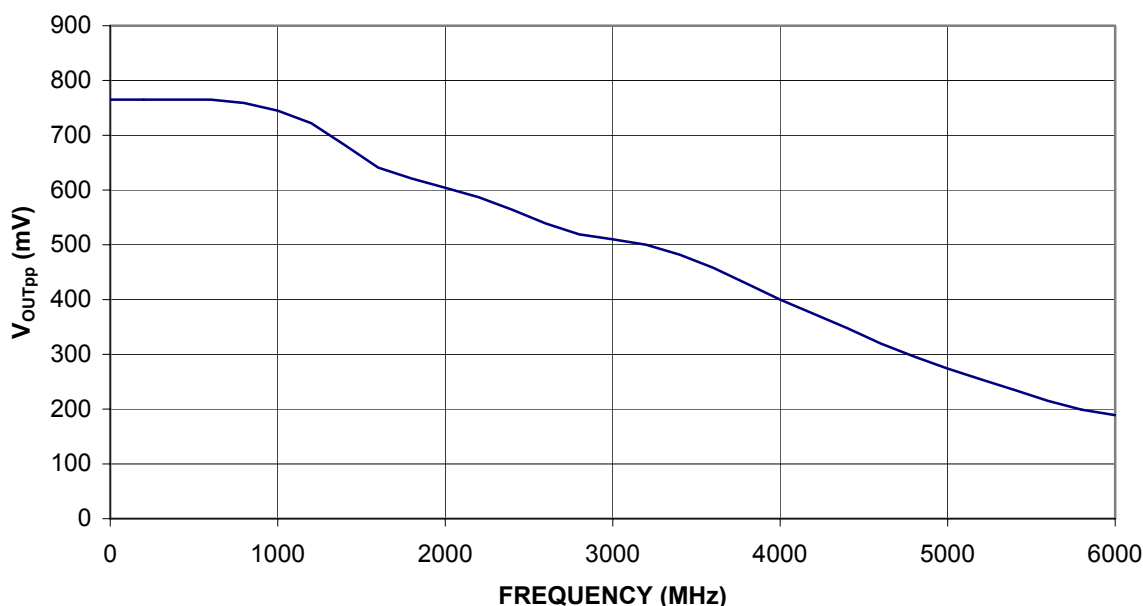
- For supply voltages other than 3.3V, use the ECL table values and ADD supply voltage value.
- Each output is terminated through a 50 Ω resistor to $V_{CC} - 2\text{V}$.

AC Characteristics ($V_{EE} = -3.0$ 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}	Maximum Toggle Frequency ⁴		>4			>4			>4			>4		GHz
t_{PLH} / t_{PHL}	Input to Output Delay (DIFF)	100	160	240	100	160	240	100	160	240	120	190	280	ps
t_{SKEW}	Duty Cycle Skew ¹ (Diff)		5			5	20		5	20		5	20	ps
$V_{PP}(\text{AC})$	Minimum Input Swing ²	150			150			150			150			mV
V_{CMR}	Common Mode Range ³	$V_{EE} + 2.0$		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

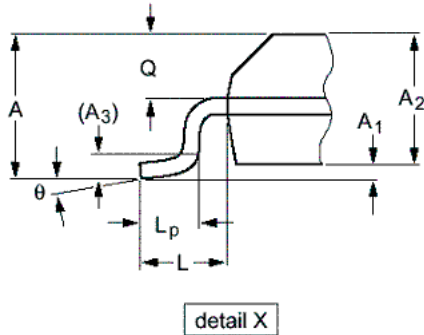
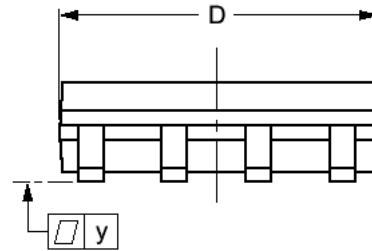
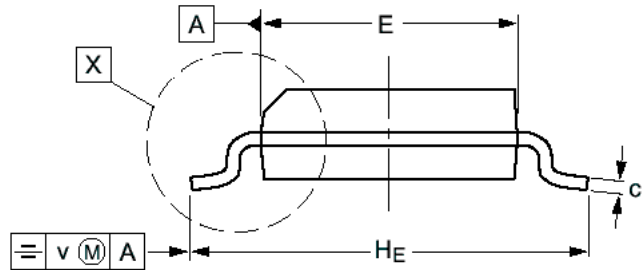
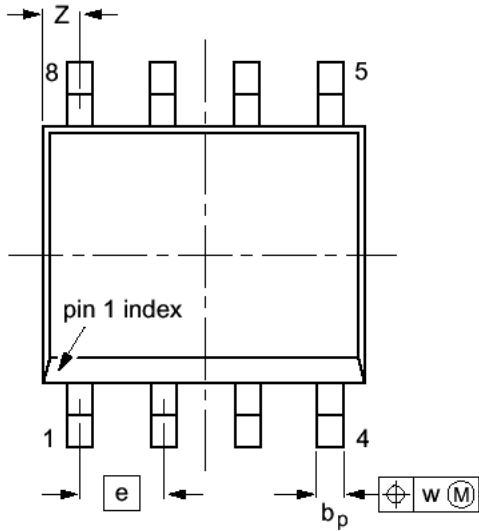
- Duty cycle skew is the difference between a t_{PLH} and t_{PHL} propagation delay through a device.
- V_{PP} is the minimum peak-to-peak differential input swing for which AC parameters are guaranteed.
- The V_{CMR} range is referenced to the most positive side of the differential input signal. Normal operation is obtained if the HIGH level falls within the specified range and the peak-to-peak voltage lies between $V_{PP}(\text{min})$ and 1V.
- See Graph Below.

Large Signal Performance*



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

PACKAGE DIAGRAM
SOIC 8

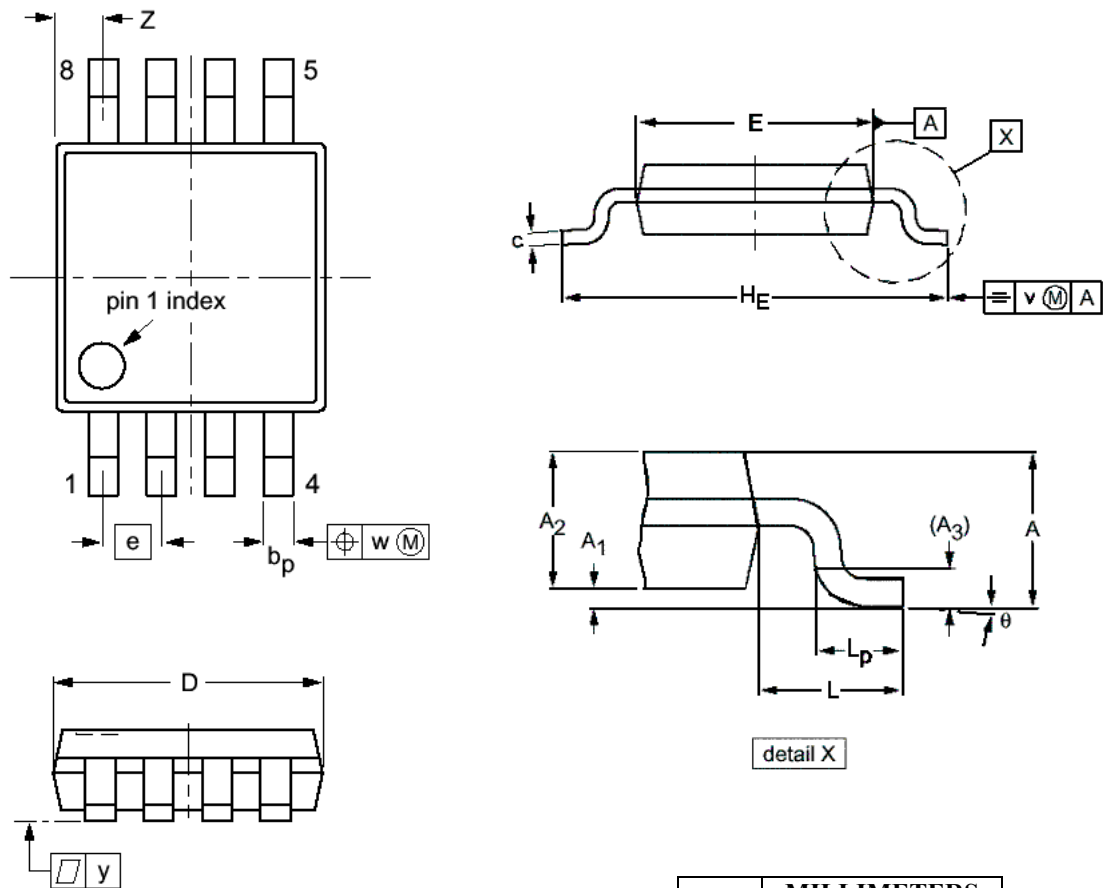


NOTES:

1. DIMENSIONS D AND E DO NOT INCLUDE MOLD PROTRUSION.
2. MAXIMUM MOLD PROTRUSION FOR D IS 0.15mm.
3. MAXIMUM MOLD PROTRUSION FOR E IS 0.25mm.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A		1.75		0.069
A ₁	0.10	0.25	0.004	0.010
A ₂	1.25	1.45	0.049	0.057
A ₃	0.25		0.01	
b _p	0.36	0.49	0.014	0.019
c	0.19	0.25	0.0075	0.0100
D	4.8	5.0	0.19	0.20
E	3.8	4.0	0.15	0.16
e	1.27		0.050	
H _E	5.80	6.20	0.228	0.244
L	1.05		0.041	
L _p	0.40	1.00	0.016	0.039
Q	0.60	0.70	0.024	0.028
v	0.25		0.01	
w	0.25		0.01	
y	0.10		0.004	
Z	0.30	0.70	0.012	0.028
θ	0°	8°	0°	8°

PACKAGE DIAGRAM
TSSOP 8



NOTES:

1. DIMENSIONS D AND E DO NOT INCLUDE MOLD PROTRUSION.
2. MAXIMUM MOLD PROTRUSION FOR D IS 0.15mm.
3. MAXIMUM MOLD PROTRUSION FOR E IS 0.25mm.

DIM	MILLIMETERS	
	MIN	MAX
A		1.10
A ₁	0.05	0.15
A ₂	0.80	0.95
A ₃	0.25	
b _p	0.25	0.45
c	0.15	0.28
D	2.90	3.10
E	2.90	3.10
e	0.65	
H _E	4.70	5.10
L	0.94	
L _p	0.40	0.70
v	0.10	
w	0.10	
y	0.10	
Z	0.35	0.70
θ	0°	6°

AZ10EP16
AZ100EP16

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