ARIZONA MICROTEK, INC.

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/$\overline{D}$ 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.

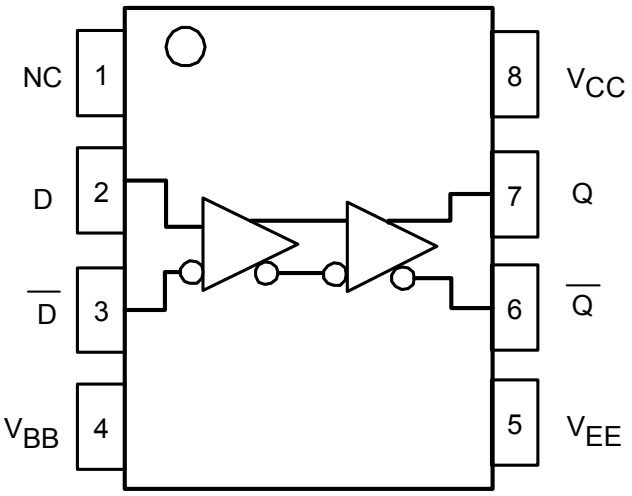
Under open input conditions internal input clamps will force the Q output LOW.

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

PIN DESCRIPTION

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

LOGIC DIAGRAM AND PINOUT ASSIGNMENT



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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 D $\overline{D}$	 0.5 -150			 0.5 -150			 0.5 -150			 0.5 -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.

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

1. For supply voltages other that 3.3V, use the ECL table values and ADD supply voltage value.
2. 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 D $\overline{D}$	 0.5 -150			 0.5 -150			 0.5 -150			 0.5 -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.

100K 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]	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 D $\overline{D}$	0.5 -150			0.5 -150			0.5 -150			0.5 -150			µA
I_{EE}	Power Supply Current	19	24	32	20	25	33	21	26	35	23	29	38	mA

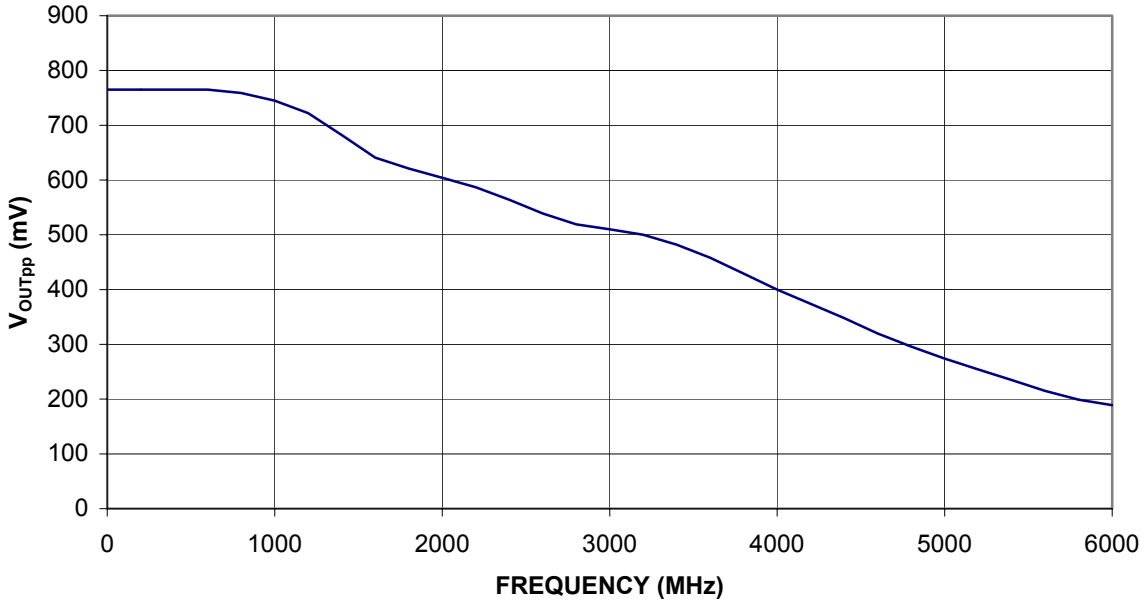
1. For supply voltages other that 3.3V, use the ECL table values and ADD supply voltage value.
2. Each output is terminated through a 50Ω resistor to V_{CC} – 2V.

AC Characteristics (V_{EE} = -3.0 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}	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} (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

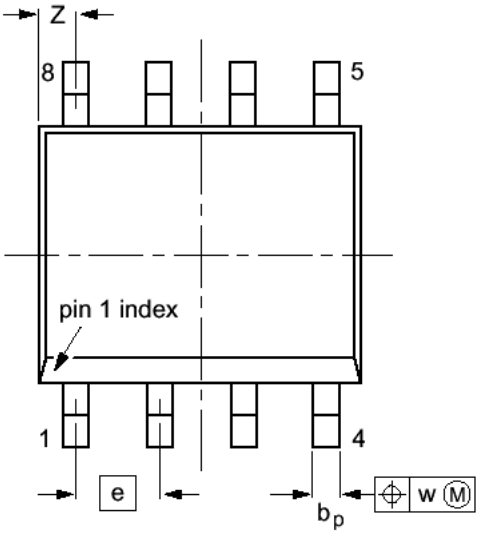
1. Duty cycle skew is the difference between a t_{PLH} and t_{PHL} propagation delay through a device.
2. V_{PP} is the minimum peak-to-peak differential input swing for which AC parameters are guaranteed.
3. The V_{CMR} range is referenced to the most positive side of the differential input signal. 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 Graph Below.

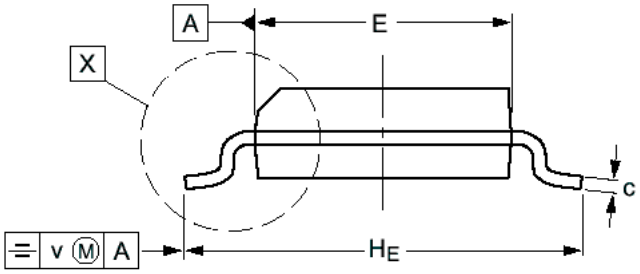
Large Signal Performance*

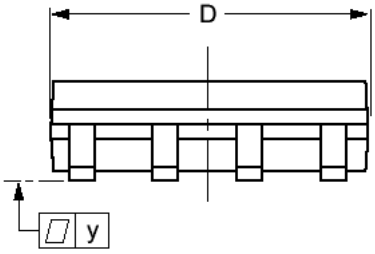


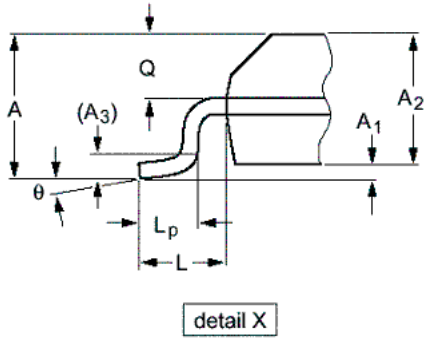
*Measured using a 750mV differential input source at 50% duty cycle.

PACKAGE DIAGRAM
SOIC 8





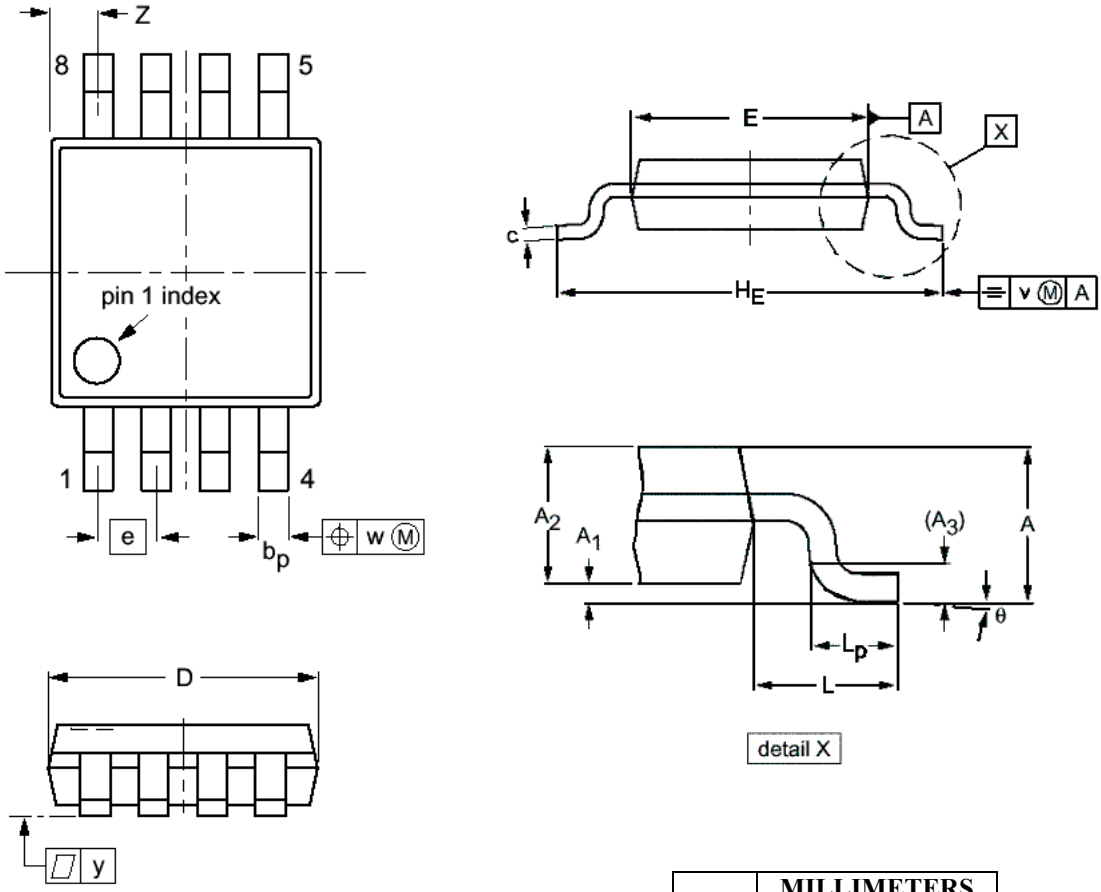




NOTES:
1. DIMENSIONS D AND E DO NOT INCLUDE MOLD PROTRUSION.
2. MAXIMUM MOLD PROTRUSION FOR D IS 0.15mm.
3. MAXIMUM MOLD PROTRUSION FOR E IS 0.25mm.

	MILLIMETERS		INCHES	
DIM	**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^O	8^O	0^O	8^O

PACKAGE DIAGRAM
TSSOP 8



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^O	6^O

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.