ARIZONA MICROTEK, INC.

AZ10E116
AZ100E116

ECL/PECL Quint Differential Line Receiver

FEATURES

- 500ps Maximum Propagation Delay
- Dedicated V_{CCO} Pin for Each Receiver
- Operating Range of 4.2V to 5.46V
- 75kΩ Internal Input Pulldown Resistors
- Direct Replacement for ON Semiconductor MC10E116 & MC100E116

PACKAGE AVAILABILITY

PACKAGE	PART NO.	MARKING
PLCC 28	AZ10E116FN	AZM10E116
PLCC 28 T&R	AZ10E116FNR2	AZM10E116
PLCC 28	AZ100E116FN	AZM100E116
PLCC 28 T&R	AZ100E116FNR2	AZM100E116

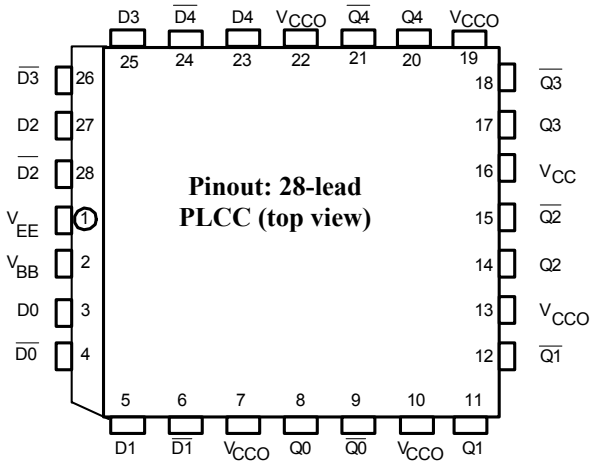
DESCRIPTION

The AZ10/100E116 is a quint differential line receiver with emitter-follower outputs. The E116 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 Dn/$\overline{D}$n differential input pair. The input signal is then fed to the other Dn/$\overline{D}$n input. The V_{BB} pin should be used only as a bias for the E116 as its sink/source capability is limited. When used, the V_{BB} pin should be bypassed to ground via a 0.01µF capacitor.

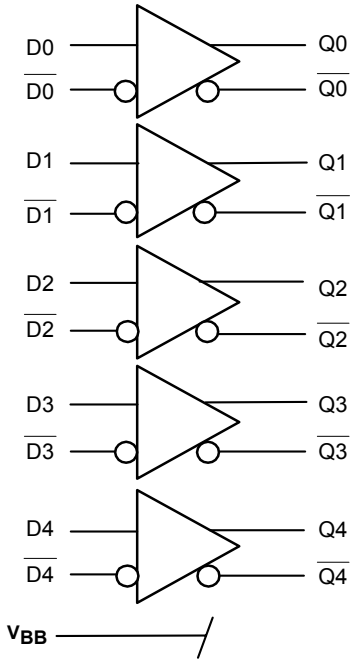
The receiver design features clamp circuitry to cause a defined state if both the inverting and non-inverting inputs are left open; in this case the Q output goes LOW, while the $\overline{Q}$ output goes HIGH. This feature makes the device ideal for twisted pair applications.

If both inverting and non-inverting inputs are at an equal potential of $> V_{CC}$ -2.5V, the receiver does not go to a defined state. This condition may produce output voltage levels between HIGH and LOW.

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



LOGIC SYMBOL



PIN DESCRIPTION

PIN	FUNCTION
D0, $\overline{D0}$ -D4, $\overline{D4}$	Differential Input Pairs
Q0, $\overline{Q0}$-Q4, $\overline{Q4}$	Differential Output Pairs
V_{BB}	Reference Voltage Output
V_{CC} , V_{CCO}	Positive Supply
V_{EE}	Negative Supply

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 +8.0	Vdc
V_I	PECL Input Voltage	(V_{EE} = 0V)	0 to +6.0	Vdc
V_{EE}	ECL Power Supply	(V_{CC} = 0V)	-8.0 to 0	Vdc
V_I	ECL Input Voltage	(V_{CC} = 0V)	-6.0 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} = -4.94V to -5.46V, V_{CC} = V_{CCO} = 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]	-1080		-890	-1020		-840	-980		-810	-910		-720	mV
V_{OL}	Output LOW Voltage[1]	-1950		-1650	-1950		-1630	-1950		-1630	-1950		-1595	mV
V_{IH}	Input HIGH Voltage	-1230		-890	-1170		-840	-1130		-810	-1060		-720	mV
V_{IL}	Input LOW Voltage	-1950		-1500	-1950		-1480	-1950		-1480	-1950		-1445	mV
V_{BB}	Reference Voltage	-1430		-1300	-1380		-1270	-1350		-1250	-1310		-1190	mV
I_{IH}	Input HIGH Current			150			150			150			150	µA
I_{IL}	Input LOW Current	0.5			0.5			0.5			0.5			µA
I_{EE}	Power Supply Current		29	35		29	35		29	35		29	35	mA

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

10K PECL DC Characteristics (V_{EE} = GND, V_{CC} = V_{CCO} = +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_{OH}	Output HIGH Voltage[1,2]	3920		4110	3980		4160	4020		4190	4090		4280	mV
V_{OL}	Output LOW Voltage[1,2]	3050		3350	3050		3370	3050		3370	3050		3405	mV
V_{IH}	Input HIGH Voltage[1]	3770		4110	3830		4160	3870		4190	3940		4280	mV
V_{IL}	Input LOW Voltage[1]	3050		3500	3050		3520	3050		3520	3050		3555	mV
V_{BB}	Reference Voltage[1]	3570		3700	3620		3730	3650		3750	3690		3810	mV
I_{IH}	Input HIGH Current			150			150			150			150	µA
I_{IL}	Input LOW Current	0.5			0.5			0.5			0.5			µA
I_{EE}	Power Supply Current		29	35		29	35		29	35		29	35	mA

1. For supply voltages other that 5.0V, 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} = -4.2V to -5.46V, V_{CC} = V_{CCO} = 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	-1005	-880	-1025	-955	-880	-1025	-955	-880	-1025	-955	-880	mV
V_{OL}	Output LOW Voltage[1]	-1830	-1695	-1555	-1810	-1705	-1620	-1810	-1705	-1620	-1810	-1705	-1620	mV
V_{IH}	Input HIGH Voltage	-1165		-880	-1165		-880	-1165		-880	-1165		-880	mV
V_{IL}	Input LOW Voltage	-1810		-1475	-1810		-1475	-1810		-1475	-1810		-1475	mV
V_{BB}	Reference Voltage	-1380		-1260	-1380		-1260	-1380		-1260	-1380		-1260	mV
I_{IH}	Input HIGH Current			150			150			150			150	µA
I_{IL}	Input LOW Current	0.5			0.5			0.5			0.5			µA
I_{EE}	Power Supply Current		29	35		29	35		29	35		29	40	mA

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

100K PECL DC Characteristics (V_{EE} = GND, V_{CC} = V_{CCO} = +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_{OH}	Output HIGH Voltage[1,2]	3915	3995	4120	3975	4045	4120	3975	4045	4120	3975	4045	4120	mV
V_{OL}	Output LOW Voltage[1,2]	3170	3305	3445	3190	3295	3380	3190	3295	3380	3190	3295	3380	mV
V_{IH}	Input HIGH Voltage[1]	3835		4120	3835		4120	3835		4120	3835		4120	mV
V_{IL}	Input LOW Voltage[1]	3190		3525	3190		3525	3190		3525	3190		3525	mV
V_{BB}	Reference Voltage[1]	3620		3740	3620		3740	3620		3740	3620		3740	mV
I_{IH}	Input HIGH Current			150			150			150			150	µA
I_{IL}	Input LOW Current	0.5			0.5			0.5			0.5			µA
I_{EE}	Power Supply Current		29	35		29	35		29	35		29	40	mA

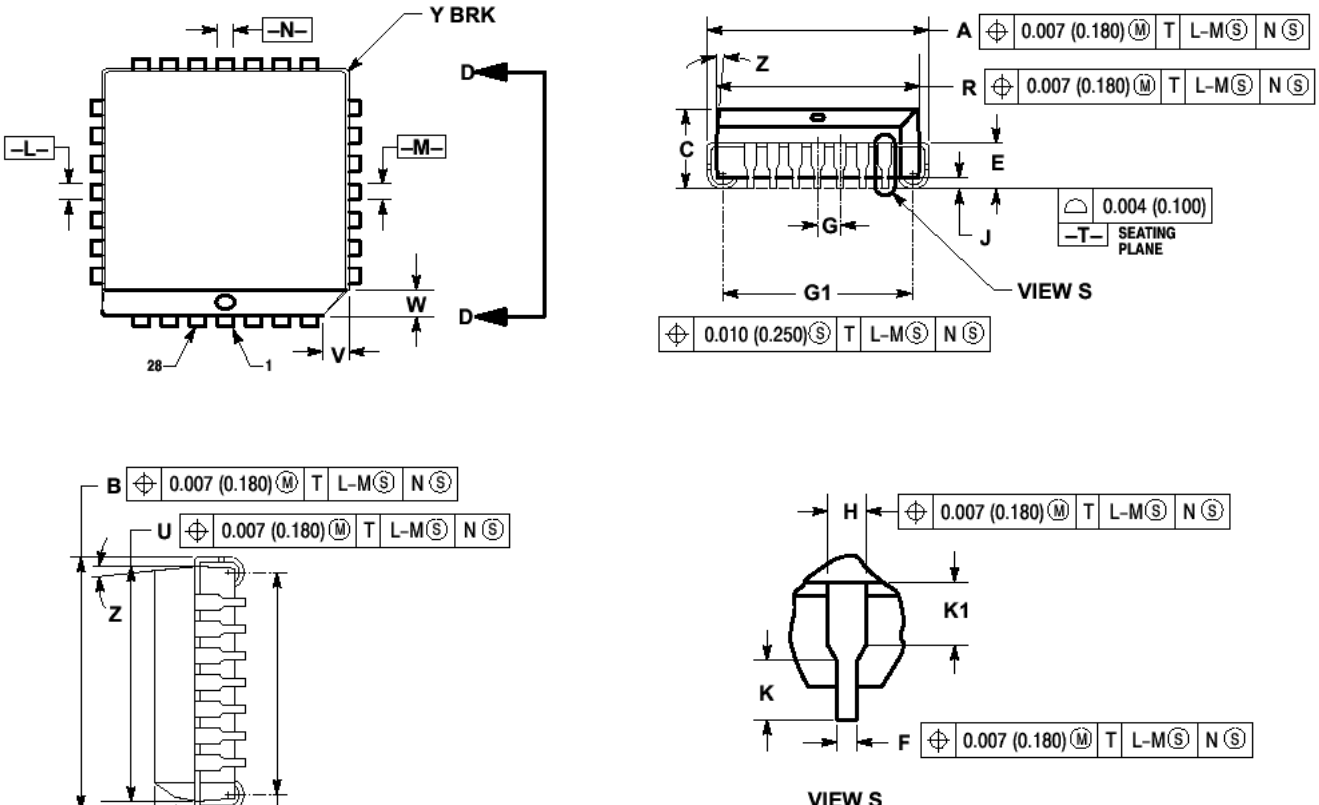
1. For supply voltages other that 5.0V, use the ECL table values and ADD supply voltage value.
2. Each output is terminated through a 50Ω resistor to V_{CC} – 2V.

AC Characteristics (V_{EE} =10E(-4.94V to -5.46V), 100E(-4.2V to -5.46V); V_{CC} =V_{CCO} =GND or V_{EE}=GND,
V_{CC}=V_{CCO} =10E(+4.94V to +5.46V),100E(+4.2V to +5.46V))

Symbol	Characteristic	-40°C			0°C			25°C			85°C			Unit	Condition
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max		
t_{PLH} /t_{PHL}	Propagation Delay to Output D (Differential) D (Single-Ended)	 150 150	 300 300	 500 550	 200 150	 300 300	 450 500	 200 150	 300 300	 450 500	 200 150	 300 300	 450 500	ps	
T_{SKEW}	Within-Device Skew[1]		50			50			50			50		ps	
T_{SKEW}	Duty Cycle Skew[2] t_{PLH} - t_{PHL}		±10			±10			±10			±10		ps	
V_{pp}(AC)	Minimum Input Swing[3]	150			150			150			150			mV	
V_{CMR}	Common Mode Range[4]	V_{CC} - 2.0		V_{CC} - 0.6	V_{CC} - 2.0		V_{CC} - 0.6	V_{CC} - 2.0		V_{CC} - 0.6	V_{CC} - 2.0		V_{CC} - 0.6	V	
t_r/t_f	Rise/Fall Time	250		625	275		575	275		575	275		575	ps	20-80%

1. Within-device skew is defined as identical transitions on similar paths through a device.
2. Duty cycle skew is defined only for differential operation. The skews are measured from the crossover point of the inputs to the crossover point of the outputs.
3. V_{PP} is the minimum peak-to-peak differential input swing for which AC parameters are guaranteed.
4. 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.

PACKAGE DIAGRAM
PLCC 28



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	12.32	12.57	0.485	0.495
B	12.32	12.57	0.485	0.495
C	4.20	4.57	0.165	0.180
E	2.29	2.79	0.090	0.110
F	0.33	0.48	0.013	0.019
G	1.27 BSC		0.050 BSC	
H	0.66	0.81	0.026	0.032
J	0.51		0.020	
K	0.64		0.025	
R	11.43	11.58	0.450	0.456
U	11.43	11.58	0.450	0.456
V	1.07	1.21	0.042	0.048
W	1.07	1.21	0.042	0.048
X	1.07	1.42	0.042	0.056
T		0.50		0.020
Z	2^{O}	10^{O}	2^{O}	10^{O}
G1	10.42	10.92	0.410	0.430
K1	1.02		0.040	

NOTES:
1. DATUMS –L-, -M-, AND –N- DETERMINED WHERE TOP OF LEAD SHOULDER EXITS PLASTIC BODY AT MOLD PARTING LINE.
2. DIMENSION G1, TRUE POSITION TO BE MEASURED AT DATUM –T-, SEATING PLANE.
3. DIMENSIONS R AND U DO NOT INCLUDE MOLD FLASH. ALOWABLE MOLD FLASH IS 0.010mm (0.250in.) PER SIDE.
4. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
5. CONTROLLING DIMENSION: INCH.
6. THE PACKAGE TOP MAY BE SMALLER THAN THE PACKGE BOTTOM BY UP TO 0.012mm (0.300in.). DIMENSIONS R AND U ARE DETERMINED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY EXCLUSIVE OF MOLD FLASH, THE BAR BURRS, GATE BURRS AND INTERLEAD FLASH, BUT INCLUDING ANY MISMATCH BETWEEN THE TOP AND BOTTOM OF THE PLASTIC BODY.
7. DIMENSION H DOES NOT INCLUDE DAMBAR PROTRUSION OR INTRUSION. THE DAMBAR PROTRUSION(S) SHALL NOT CAUSE THE H DIMENSION TO BE SMALLER THAN 0.025mm (0.635in.).