

# AZ100LVEL16

## ECL/PECL Differential Receiver

### FEATURES

- Green and RoHS Compliant / Lead (Pb) Free Packages available
- 250ps Propagation Delay
- High Bandwidth Output Transitions
- Operating Range of 3.0V to 5.5V
- Internal Input Pulldown Resistors
- Direct Replacement For ON Semiconductor MC100EL16 & MC100LVEL16
- IBIS Model Files Available on Arizona Microtek Website
- >2 kV HBM ESD Protection
- Additional ESD Data Available on Arizona Microtek Website

### PACKAGE AVAILABILITY

PACKAGE	PART NUMBER	MARKING	NOTES
SOIC 8 Green / RoHS Compliant / Lead (Pb) Free	AZ100LVEL16DG	AZM100G LVEL16	1,2
MSOP 8 RoHS Compliant / Lead (Pb) Free	AZ100LVEL16T+	AZH+ LV16	1,2
MLP 8 (2x2) Green / RoHS Compliant / Lead (Pb) Free	AZ100LVEL16NG	Q6G <Date Code>	1,3

- 1 Add R1 at end of part number for 7 inch (1K parts), R2 for 13 inch (2.5K parts) Tape & Reel.
- 2 Date code format: "Y" or "YY" for year followed by "WW" for week on underside of part.
- 3 Date code format: "Y" for year followed by "WW" for week.

### DESCRIPTION

The AZ100LVEL16 is a differential receiver. The device is functionally equivalent to the E116 device with higher performance capabilities. With output transition times significantly faster than the E116, the LVEL16 is ideally suited for interfacing with high frequency sources.

The LVEL16 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 1.5 mA sink/source current. When used, the  $V_{BB}$  pin should be bypassed to ground via a 0.01  $\mu$ F capacitor.

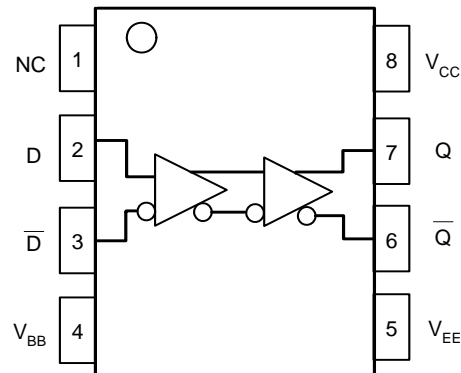
Under open input conditions internal input clamps will force the Q output LOW.

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

### PIN DESCRIPTION

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

### PINOUT ASSIGNMENT



# AZ100LVEL16

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

Symbol	Characteristic	Rating	Unit
V <sub>CC</sub>	PECL Power Supply (V <sub>EE</sub> = 0V)	0 to +8.0	Vdc
V <sub>I</sub>	PECL Input Voltage (V <sub>EE</sub> = 0V)	0 to +6.0	Vdc
V <sub>EE</sub>	ECL Power Supply (V <sub>CC</sub> = 0V)	-8.0 to 0	Vdc
V <sub>I</sub>	ECL Input Voltage (V <sub>CC</sub> = 0V)	-6.0 to 0	Vdc
I <sub>OUT</sub>	Output Current --- Continuous --- Surge	50 100	mA
T <sub>A</sub>	Operating Temperature Range	-40 to +85	°C
T <sub>STG</sub>	Storage Temperature Range	-65 to +150	°C

**ECL DC Characteristics (V<sub>EE</sub> = -3.0V to -5.5V, V<sub>CC</sub> = 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 <sub>OH</sub>	Output HIGH Voltage <sup>1</sup>	-1085	-1005	-880	-1025	-955	-880	-1025	-955	-880	-1025	-955	-880	mV
V <sub>OL</sub>	Output LOW Voltage <sup>1</sup>	-1830	-1695	-1555	-1810	-1705	-1620	-1810	-1705	-1620	-1810	-1705	-1620	mV
V <sub>IH</sub>	Input HIGH Voltage	-1165		-880	-1165		-880	-1165		-880	-1165		-880	mV
V <sub>IL</sub>	Input LOW Voltage	-1810		-1475	-1810		-1475	-1810		-1475	-1810		-1475	mV
V <sub>BB</sub>	Reference Voltage	-1380		-1260	-1380		-1260	-1380		-1260	-1380		-1260	mV
I <sub>IL</sub>	Input LOW Current	-150			-150			-150			-150			μA
I <sub>IH</sub>	Input HIGH Current			150			150			150			150	μA
I <sub>EE</sub>	Power Supply Current		18	22		18	22		18	22		18	24	mA

- Each output is terminated through a 50Ω resistor to V<sub>CC</sub> - 2V.

**LVPECL DC Characteristics (V<sub>EE</sub> = GND, V<sub>CC</sub> = +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 <sub>OH</sub>	Output HIGH Voltage <sup>1,2</sup>	2215	2295	2420	2275	2345	2420	2275	2345	2420	2275	2345	2420	mV
V <sub>OL</sub>	Output LOW Voltage <sup>1,2</sup>	1470	1605	1745	1490	1595	1680	1490	1595	1680	1490	1595	1680	mV
V <sub>IH</sub>	Input HIGH Voltage <sup>1</sup>	2135		2420	2135		2420	2135		2420	2135		2420	mV
V <sub>IL</sub>	Input LOW Voltage <sup>1</sup>	1490		1825	1490		1825	1490		1825	1490		1825	mV
V <sub>BB</sub>	Reference Voltage <sup>1</sup>	1920		2040	1920		2040	1920		2040	1920		2040	mV
I <sub>IL</sub>	Input LOW Current	-150			-150			-150			-150			μA
I <sub>IH</sub>	Input HIGH Current			150			150			150			150	μA
I <sub>EE</sub>	Power Supply Current		18	22		18	22		18	22		18	24	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<sub>CC</sub> - 2V.

**PECL DC Characteristics (V<sub>EE</sub> = GND, V<sub>CC</sub> = +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 <sub>OH</sub>	Output HIGH Voltage <sup>1,2</sup>	3915	3995	4120	3975	4045	4120	3975	4045	4120	3975	4045	4120	mV
V <sub>OL</sub>	Output LOW Voltage <sup>1,2</sup>	3170	3305	3445	3190	3295	3380	3190	3295	3380	3190	3295	3380	mV
V <sub>IH</sub>	Input HIGH Voltage <sup>1</sup>	3835		4120	3835		4120	3835		4120	3835		4120	mV
V <sub>IL</sub>	Input LOW Voltage <sup>1</sup>	3190		3525	3190		3525	3190		3525	3190		3525	mV
V <sub>BB</sub>	Reference Voltage <sup>1</sup>	3620		3740	3620		3740	3620		3740	3620		3740	mV
I <sub>IL</sub>	Input LOW Current	-150			-150			-150			-150			μA
I <sub>IH</sub>	Input HIGH Current			150			150			150			150	μA
I <sub>EE</sub>	Power Supply Current		18	22		18	22		18	22		18	24	mA

- For supply voltages other than 5.0V, use the ECL table values and ADD supply voltage value.
- Each output is terminated through a 50Ω resistor to V<sub>CC</sub> - 2V.

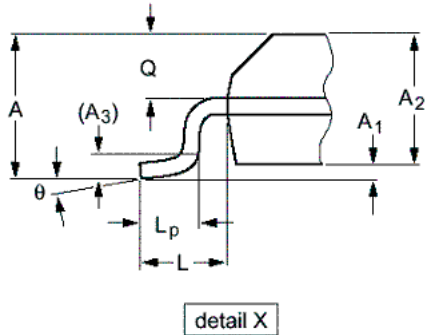
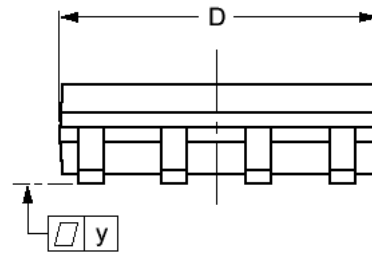
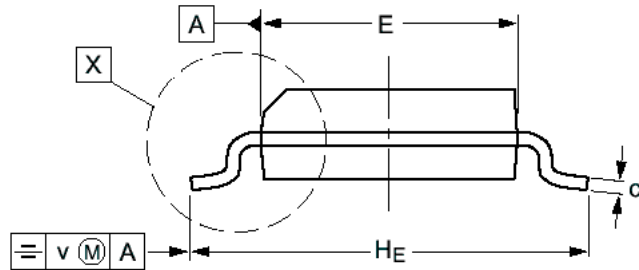
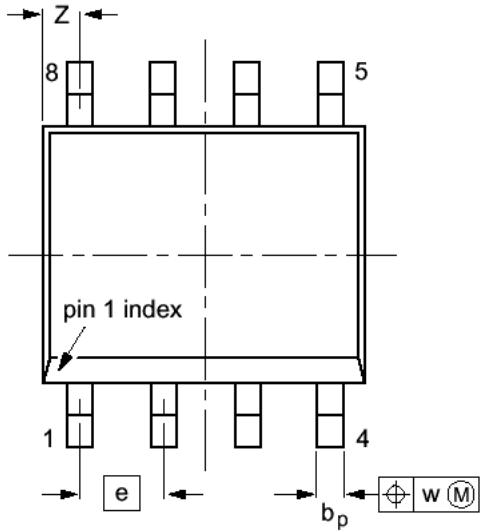
## AZ100LVEL16

### AC Characteristics ( $V_{EE} = -3.0V$ to $-5.5V$ ; $V_{CC} = GND$ or $V_{EE} = GND$ ; $V_{CC} = +3.0V$ to $+5.5V$ )

Symbol	Characteristic	-40°C			0°C			25°C			85°C			Unit
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
$t_{PLH} / t_{PHL}$	Propagation Delay to Output (Diff) (SE)	125	250	375	175	250	325	175	250	325	205	280	355	ps
$t_{SKEW}$	Duty Cycle Skew <sup>1</sup> (Diff)		5			5	20		5	20		5	20	ps
$V_{PP} (AC)$	Input Swing <sup>2</sup>	150		1000	150		1000	150		1000	150		1000	mV
$V_{CMR}$	Common Mode Range <sup>3</sup>	$V_{EE} +$		$V_{CC} -$	$V_{EE} +$		$V_{CC} -$	$V_{EE} +$		$V_{CC} -$	$V_{EE} +$		$V_{CC} -$	V
	$V_{PP} < 500mV$	1.2		0.4	1.1		0.4	1.1		0.4	1.1		0.4	
	$V_{PP} \geq 500mV$	1.5		0.4	1.4		0.4	1.4		0.4	1.4		0.4	
$t_r / t_f$	Output Rise/Fall Times Q (20% - 80%)	100		260	100		260	100		260	100		260	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 peak-to-peak differential input swing range for which AC parameters are guaranteed. The device has a DC gain of  $\approx 40$ .
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.

**PACKAGE DIAGRAM  
SOIC 8**

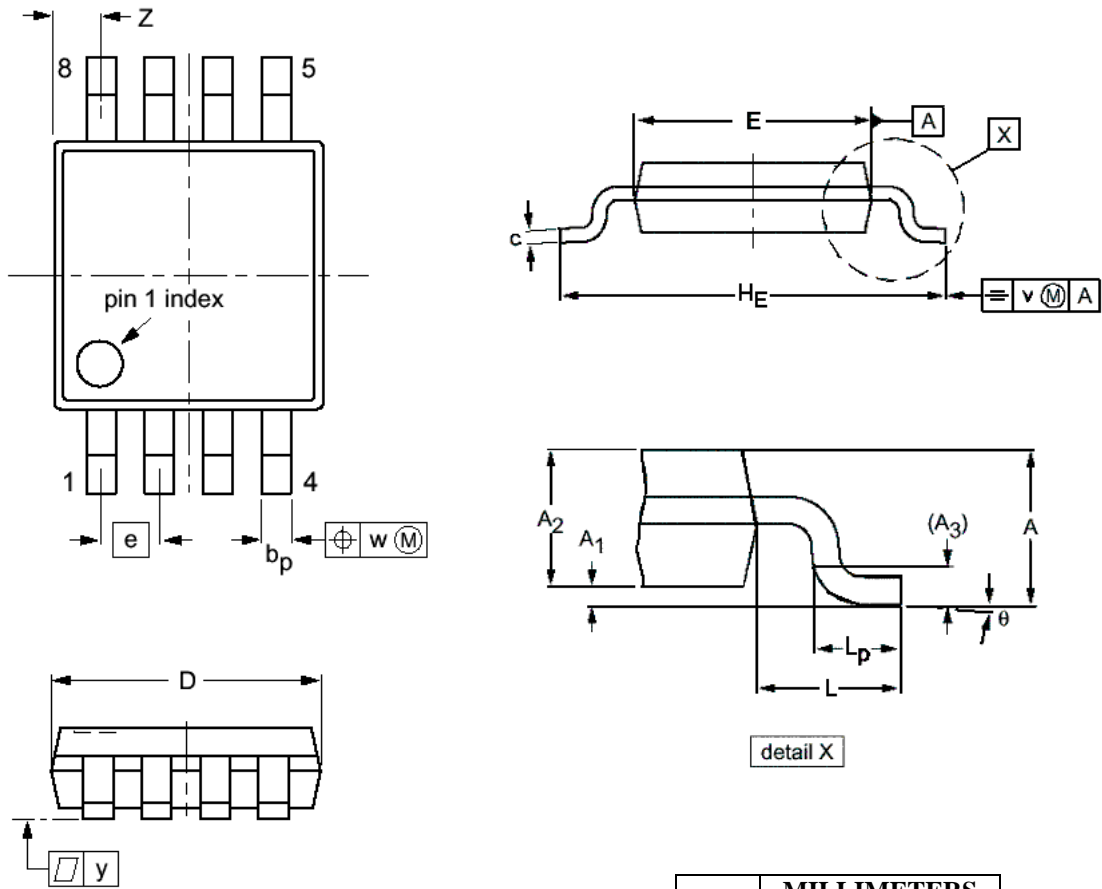


DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A		1.75		0.069
A <sub>1</sub>	0.10	0.25	0.004	0.010
A <sub>2</sub>	1.25	1.45	0.049	0.057
A <sub>3</sub>	0.25		0.01	
b <sub>p</sub>	0.36	0.49	0.014	0.019
c	0.19	0.25	0.0075	0.0100
D	4.8	5.0	0.19	0.20
E	3.8	4.0	0.15	0.16
e	1.27		0.050	
H <sub>E</sub>	5.80	6.20	0.228	0.244
L	1.05		0.041	
L <sub>p</sub>	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°

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.

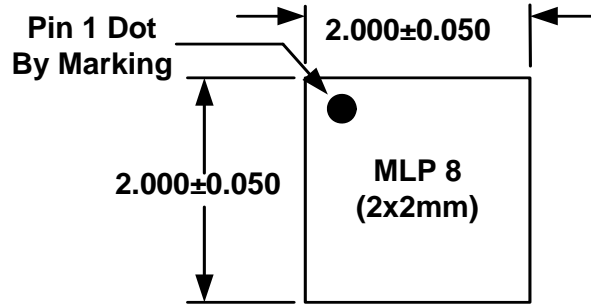
**PACKAGE DIAGRAM  
MSOP 8**



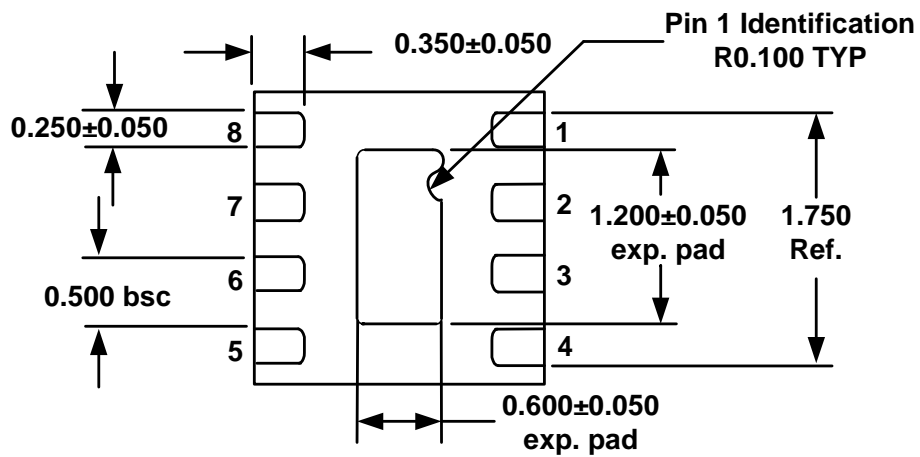
- NOTES:
1. DIMENSIONS D AND E DO NOT INCLUDE MOLD PROTRUSION.
  2. MAXIMUM MOLD PROTRUSION FOR D IS 0.15mm.
  3. MAXIMUM MOLD PROTRUSION FOR E IS 0.25mm.

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

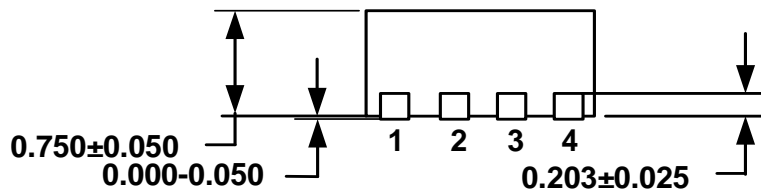
**PACKAGE DIAGRAM**  
**MLP 8 2x2mm**



TOP VIEW



BOTTOM VIEW



SIDE VIEW

**Note: All dimensions are in mm**

## AZ100LEVEL16

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