ARIZONA MICROTEK, INC.

AZ100EL16VS

ECL/PECL Differential Receiver with Variable Output Swing

FEATURES

- 250ps Propagation Delay
- High Bandwidth Output Transitions
- 75kΩ Internal Input Pulldown Resistors
- Functionally Equivalent to ON Semiconductor MC100EL16
- Variable Output Swing
- Available in a 3x3mm MLP Package

PACKAGE AVAILABILITY

PACKAGE	PART NO.	MARKING
MLP 8	AZ100EL16VSL	AZM16P
MLP 8 T&R	AZ100EL16VSLR1	AZM16P
MLP 8 T&R	AZ100EL16VSLR2	AZM16P
SOIC 8	AZ100EL16VSD	AZM100EL16VS
SOIC 8 T&R	AZ100EL16VSDR1	AZM100EL16VS
SOIC 8 T&R	AZ100EL16VSDR2	AZM100EL16VS
TSSOP 8	AZ100EL16VST	AZH16VS
TSSOP 8 T&R	AZ100EL16VSTR1	AZH16VS
TSSOP 8 T&R	AZ100EL16VSTR2	AZH16VS

DESCRIPTION

The AZ100EL16VS is a differential receiver with variable output swing. The EL16VS has functionality and output transition times similar to the EL16, with an input that controls the amplitude of the Q/$\overline{Q}$ outputs. Maximum swing is achieved by leaving the V_{CTRL} pin open or tied to V_{EE}.

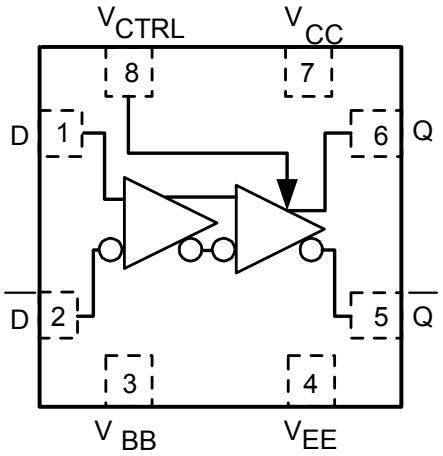
The operational range of the EL16VS control input, V_{CTRL}, is from V_{BB} (full swing) to V_{CC} (min. swing). Simple control of the output swing can be obtained by a variable resistor between the V_{BB} and V_{CC} pins, with the wiper driving V_{CTRL}. Typical application circuits and results are described in this Data Sheet.

The EL16VS 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 1.0mA sink/source current. When used, the V_{BB} pin should be bypassed to ground via a 0.01µF capacitor.

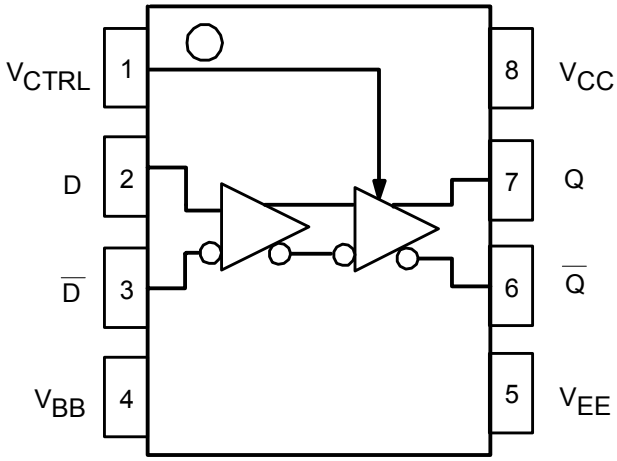
Under open input conditions (pulled to V_{EE}) internal input clamps will force the Q output LOW.

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

LOGIC DIAGRAM AND PINOUT ASSIGNMENT



8 MLP (TOP VIEW)



8 SOIC & 8 TSSOP

PIN DESCRIPTION

PIN	FUNCTION
D, $\overline{D}$	Data Inputs
V_{CTRL}	Output Swing Control
Q, $\overline{Q}$	Data Outputs
V_{BB}	Reference Voltage Output
V_{CC}	Positive 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

100K ECL DC Characteristics (V_{EE} = -4.2V to -5.5V, V_{CC} = GND; V_{CTRL} = V_{BB})

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[2]	-1085		-880	-1025		-880	-1025	-955	-880	-1025		-880	mV
V_{OL}	Output LOW Voltage[2] V_{CTRL} = V_{BB}[1]	-1890		-1620	-1870		-1680	-1870	-1775	-1680	-1870		-1680	mV
V_{OL}	Output LOW Voltage[2] V_{CTRL} = V_{CC}	-1180		-975	-1135		-990	-1135	-1065	-990	-1135		-990	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	-1420		-1260	-1420		-1260	-1420		-1260	-1420		-1260	mV
I_{IH}	Input HIGH Current D, $\overline{D}$ V_{CTRL}			 150 40			 150 40			 150 40			 150 40	µA
I_{IL}	Input LOW Current	0.5			0.5			0.5			0.5			µA
I_{EE}	Power Supply Current		18	25		18	25		18	25		21	26	mA

1. If V_{CTRL} is Open Circuit, use the V_{OH} (Max & Min) and V_{OL} (V_{CTRL} = V_{REF} : Max only) limits.
2. Each output is terminated through a 50Ω resistor to V_{CC} – 2V.

100K PECL DC Characteristics (V_{EE} = GND, V_{CC} = +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[1,3]	3915		4120	3975		4120	3975	4045	4120	3975		4120	mV
V_{OL}	Output LOW Voltage[1,3] $V_{CTRL} = V_{BB}$[2]	3110		3380	3130		3320	3130	3225	3320	3130		3320	mV
V_{OL}	Output LOW Voltage[1,3] $V_{CTRL} = V_{CC}$	3820		4025	3865		4010	3865	3935	4010	3865		4010	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]	3580		3740	3580		3740	3580		3740	3580		3740	mV
I_{IH}	Input HIGH Current D, $\overline{D}$ V_{CTRL}			 150 40			 150 40			 150 40			 150 40	µA
I_{IL}	Input LOW Current	0.5			0.5			0.5			0.5			µA
I_{EE}	Power Supply Current		18	25		18	25		18	25		21	26	mA

1. For supply voltages other that 5.0V, use the ECL table values and ADD supply voltage value.
2. If V_{CTRL} is Open Circuit, use the V_{OH} (Max & Min) and V_{OL} ($V_{CTRL} = V_{REF}$: Max only) limits.
3. Each output is terminated through a 50Ω resistor to V_{CC} – 2V.

AC Characteristics (V_{EE} = -4.2V to -5.5V; V_{CC} =GND or V_{EE} =GND; V_{CC} = +4.2V 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}	Input to Output Delay (Diff) (SE)		 250 250		 175 125	 250 250	 325 375	 175 125	 250 250	 325 375	 205 155	 280 280	 355 405	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_{CC} - 2.0		V_{CC} - 0.4	V_{CC} - 2.0		V_{CC} - 0.4	V_{CC} - 2.0		V_{CC} - 0.4	V_{CC} - 2.0		V_{CC} - 0.4	V
t_r / t_f	Rise/Fall Time 20 – 80%	100		350	100		350	100		350	100		350	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.

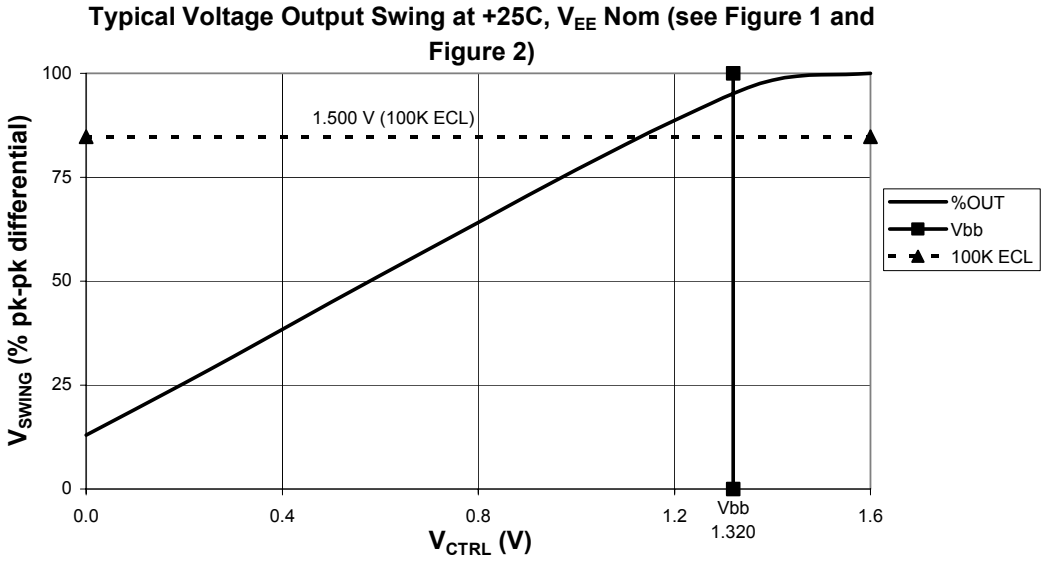


Figure 1: Voltage Source Implementation

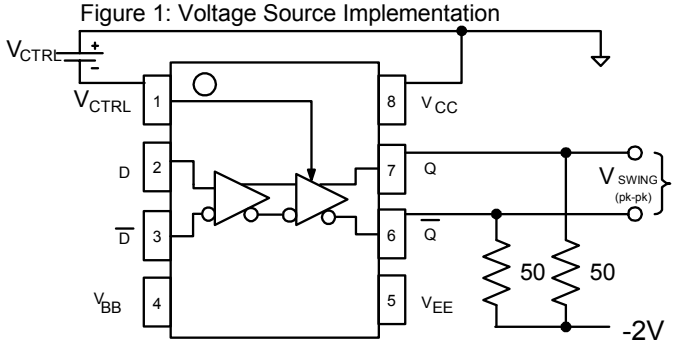
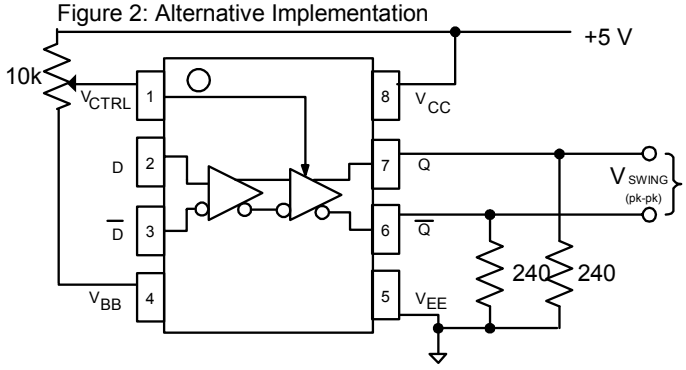
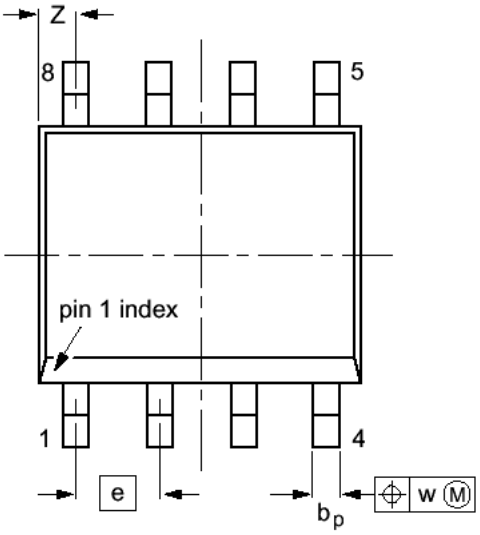
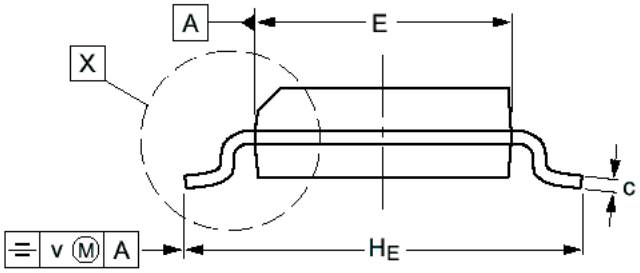


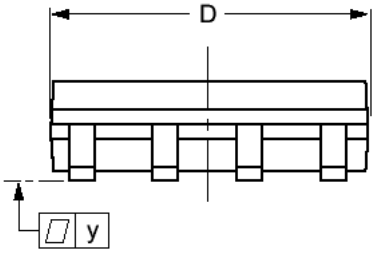
Figure 2: Alternative Implementation

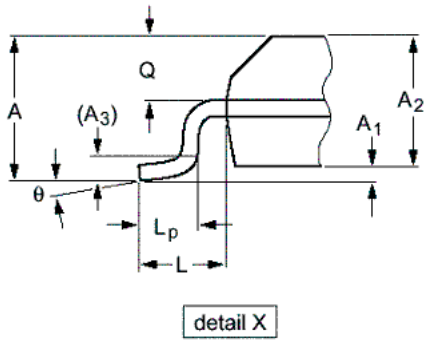


PACKAGE DIAGRAM
SOIC 8





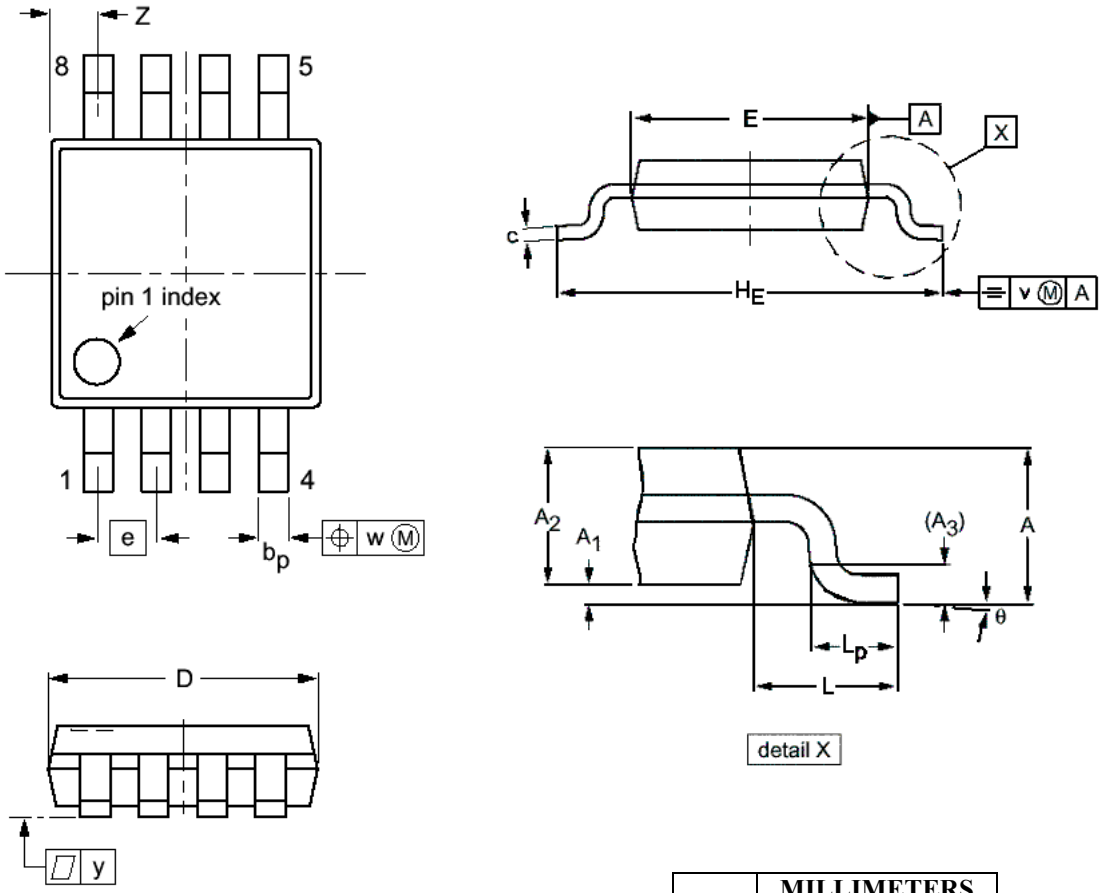




NOTES:
1. DIMENSIONS D AND E DO NOT INCLUDE MOLD PROTRUSION.
2. MAXIMUM MOLD PROTRUSION FOR D IS 0.15mm.
3. MAXIMUM MOLD PROTRUSION FOR E IS 0.25mm.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	12.32	12.57	0.485	0.495
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

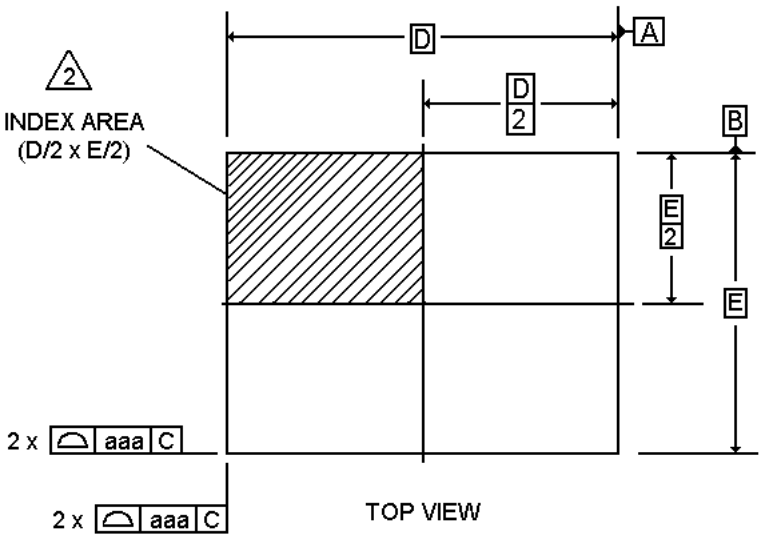


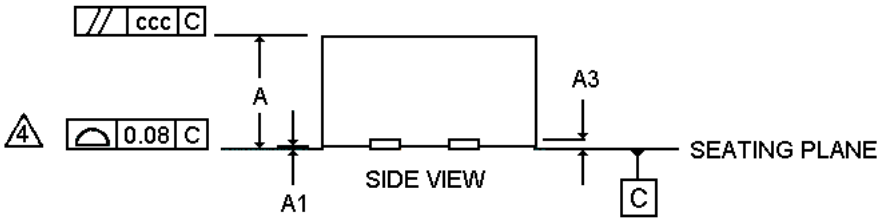
NOTES:
1. DIMENSIONS D AND E DO NOT INCLUDE MOLD PROTRUSION.
2. MAXIMUM MOLD PROTRUSION FOR D IS 0.15mm.
3. MAXIMUM MOLD PROTRUSION FOR E IS 0.25mm.

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^O	6^O

AZ100EL16VS

PACKAGE DIAGRAM
MLP 8





NOTES

1. DIMENSIONING AND TOLERANCING CONFORM TO ASME T14-1994.
2. THE TERMINAL #1 AND PAD NUMBERING CONVENTION SHALL CONFORM TO JESD 95-1 SPP-012.
3. DIMENSION b APPLIES TO METALLIZED PAD AND IS MEASURED BETWEEN 0.25 AND 0.30mm FROM PAD TIP.
4. COPLANARITY APPLIES TO THE EXPOSED PAD AS WELL AS THE TERMINALS.

	MILLIMETERS	
DIM	**MIN**	**MAX**
A	0.80	1.00
A1	0.00	0.05
A3	0.25 REF	
b	0.30	0.35
D	2.90	3.10
D2	1.65	1.95
E	2.90	3.10
E2	1.65	1.95
e	0.65 BSC	
L	0.35	0.45
aaa	0.25	
bbb	0.10	
ccc	0.10