

AZ100LVEL32

ECL/PECL ÷ 2 Divider

FEATURES

- Operating Range of 3.0V to 5.5V
- 470ps Propagation Delay
- 3.0+ GHz Toggle Frequency
- High Bandwidth Output Transitions
- Direct Replacement for ON Semiconductor MC100EL/LVEL32
- >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	AZ100LVEL32DG	AZM100G LVEL32	1,2
MSOP 8 Green / RoHS Compliant / Lead (Pb) Free	AZ100LVEL32TG	AZHG LV32	1,2
MLP 8 (2x2) Green / RoHS Compliant / Lead (Pb) Free	AZ100LVEL32NG	C2G <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 AZ100LVEL32 is an integrated ÷2 divider. The reset pin is asynchronous and is asserted on the rising edge. Upon power-up, the internal flip-flop will attain a random logic state; the reset allows for the synchronization of multiple LVEL32's in a system.

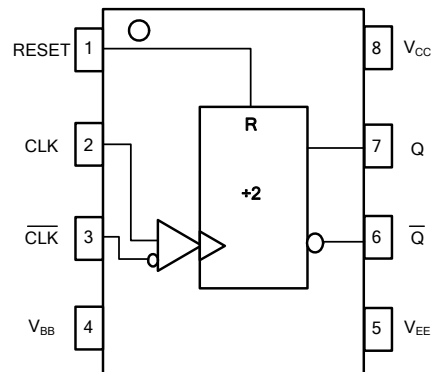
The LVEL32 provides a V_{BB} output for single-ended use or a DC bias reference for AC coupling to the device. For single-ended input applications, the V_{BB} reference should be connected to one side of the CLK/CLK differential input pair. The input signal is then fed to the other CLK/CLK input. The V_{BB} pin should be used only as a bias for the LVEL32 as its sink/source capability is limited. When used, the V_{BB} pin should be bypassed to ground via a 0.01 μ F capacitor.

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

LOGIC DIAGRAM AND PINOUT ASSIGNMENT

PIN DESCRIPTION

PIN	FUNCTION
CLK, CLK	Clock Inputs
RESET	Asynchronous Reset
V_{BB}	Reference Voltage Output
Q, Q	Data Outputs
V_{CC}	Positive Supply
V_{EE}	Negative Supply



AZ100LEVEL32

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 +6.0	Vdc
V _I	PECL Input Voltage (V _{EE} = 0V)	0 to +6.0	Vdc
V _{EE}	ECL Power Supply (V _{CC} = 0V)	-6.0 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

ECL DC Characteristics (V_{EE} = -3.0V to -5.5V, 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	-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
I _{IH}	Input HIGH Current			150			150			150			150	µA
I _{IL}	Input LOW Current CLK, CLK RESET	-150 0.5			-150 0.5			-150 0.5			-150 0.5			µA
V _{BB}	Output Reference Voltage	-1380		-1260	-1380		-1260	-1380		-1260	-1380		-1260	mV
I _{EE}	Power Supply Current		25	30		25	30		25	30		29	35	mA

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

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	2295	2420	2275	2345	2420	2275	2345	2420	2275	2345	2420	mV
V _{OL}	Output LOW Voltage ^{1,2}	1470	1605	1745	1490	1595	1680	1490	1595	1680	1490	1595	1680	mV
V _{IH}	Input HIGH Voltage ¹	2135		2420	2135		2420	2135		2420	2135		2420	mV
V _{IL}	Input LOW Voltage ¹	1490		1825	1490		1825	1490		1825	1490		1825	mV
I _{IH}	Input HIGH Current			150			150			150			150	µA
I _{IL}	Input LOW Current CLK, CLK RESET	-150 0.5			-150 0.5			-150 0.5			-150 0.5			µA
V _{BB}	Output Reference Voltage ¹	1920		2040	1920		2040	1920		2040	1920		2040	mV
I _{EE}	Power Supply Current		25	30		25	30		25	30		29	35	mA

1. For supply voltages other than 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.

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 ^{1,2}	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
I _{IH}	Input HIGH Current			150			150			150			150	µA
I _{IL}	Input LOW Current CLK, CLK RESET	-150 0.5			-150 0.5			-150 0.5			-150 0.5			µA
V _{BB}	Output Reference Voltage ¹	3620		3740	3620		3740	3620		3740	3620		3740	mV
I _{EE}	Power Supply Current		25	30		25	30		25	30		29	35	mA

1. For supply voltages other than 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.

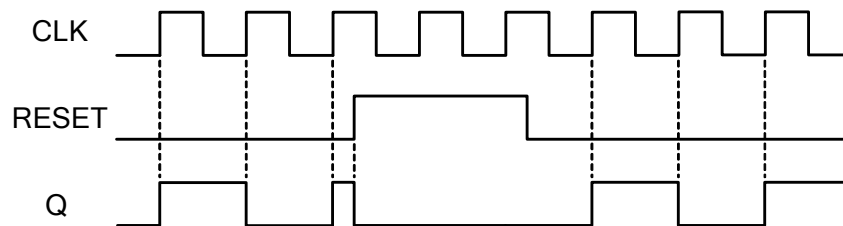
AZ100LVEL32

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

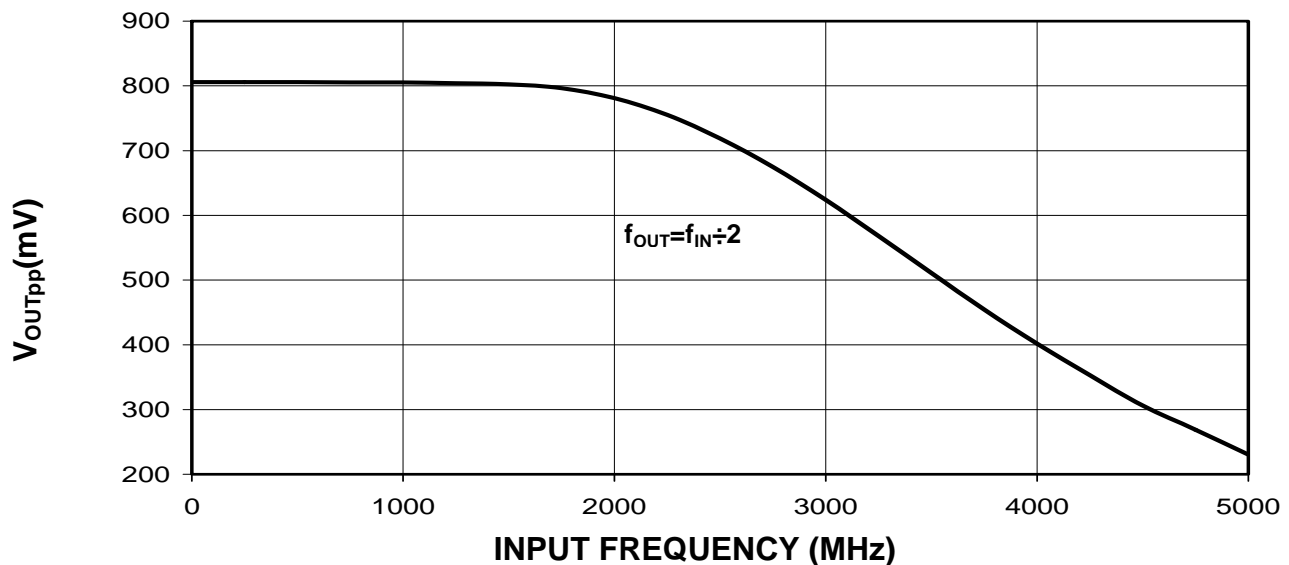
Symbol	Characteristic	-40°C			0°C			25°C			85°C			Unit
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
f_{max}	Maximum Toggle Frequency	2.6			2.6			2.6			2.6			GHz
t_{PLH}/t_{PHL}	Propagation Delay CLK, CLK to Q/Q RESET to Q/Q	360 390	450 540	540 690	370 440	460 540	550 640	380 440	470 540	560 640	400 450	490 550	580 650	ps
V_{PP} (AC)	Input Swing ¹	150		1000	150		1000	150		1000	150		1000	mV
V_{CMR}	Common Mode Range ² $V_{PP} < 500$ mV $V_{PP} \geq 500$ mV	$V_{EE} + 1.2$ 1.4		$V_{CC} - 0.4$ 0.4	$V_{EE} + 1.1$ 1.3		$V_{CC} - 0.4$ 0.4	$V_{EE} + 1.1$ 1.3		$V_{CC} - 0.4$ 0.4	$V_{EE} + 1.1$ 1.3		$V_{CC} - 0.4$ 0.4	V
t_r / t_f	Output Rise/Fall Times Q/Q (20% - 80%)	100		260	100		260	100		260	100		260	ps

- V_{PP} is the peak-to-peak differential input swing range for which AC parameters are guaranteed.
- V_{CMR} is defined as the range within which the V_{IH} level may vary, with the device still meeting the propagation delay specification. The V_{IL} level must be such that V_{PP} is within the differential input swing range specified.

Figure 1: Timing Diagram

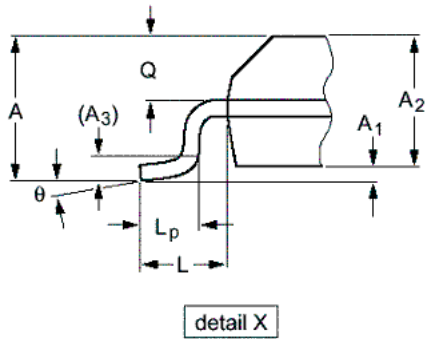
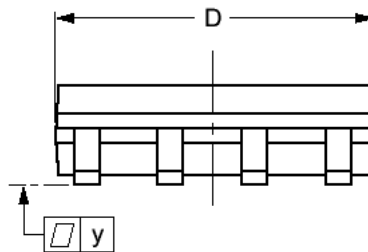
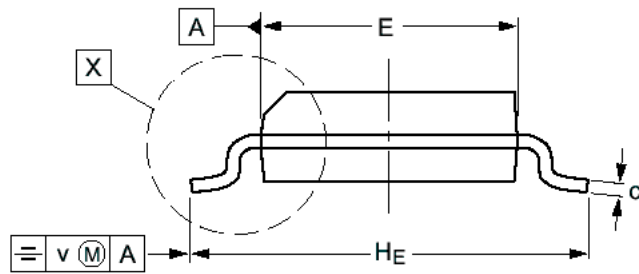
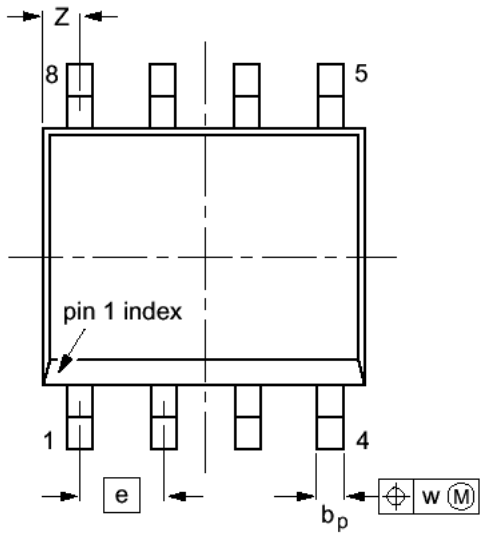


Typical Large Signal Output Swing, Q/Q



Measured with 750mV D input, Q/Q each terminated to $V_{CC}-2V$ via 50Ω resistors.

**PACKAGE DIAGRAM
SOIC 8**

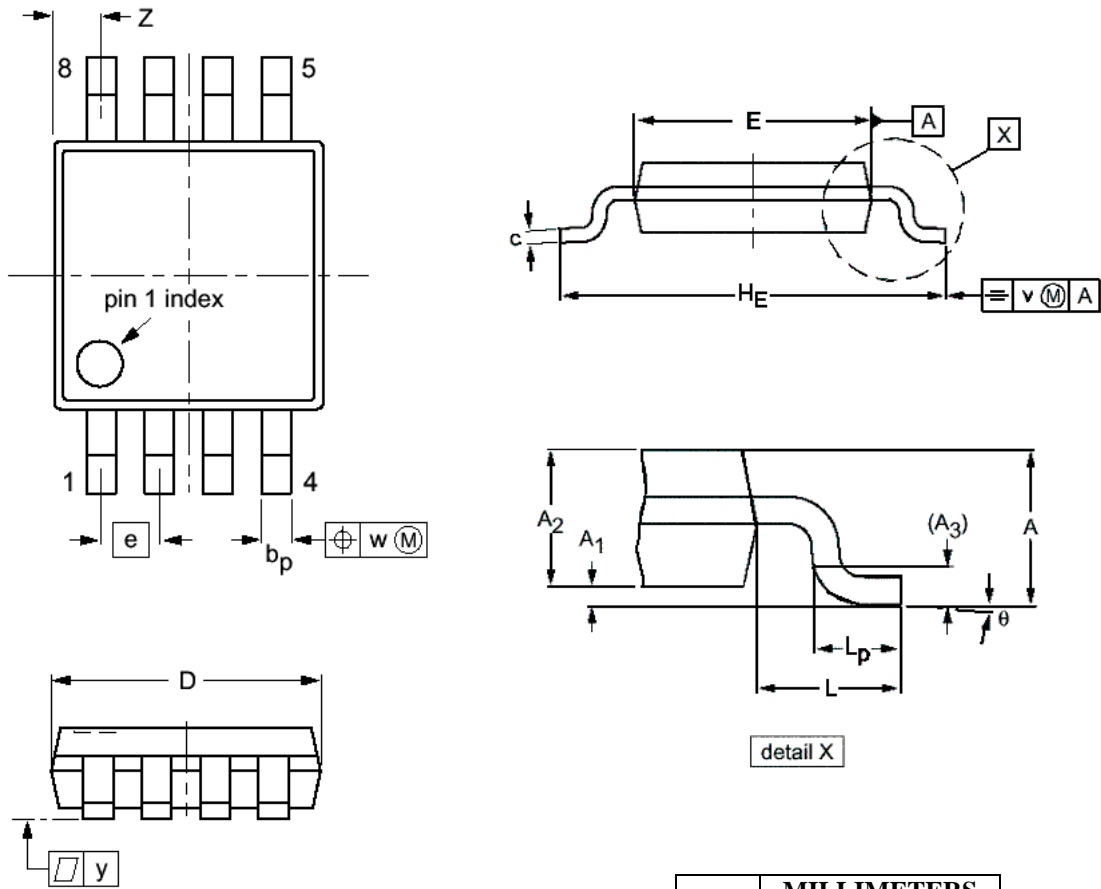


DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A		1.75	0.069	
A ₁	0.10	0.25	0.004	0.010
A ₂	1.25	1.45	0.049	0.057
A ₃	0.25		0.01	
b _p	0.36	0.49	0.014	0.019
c	0.19	0.25	0.0075	0.0100
D	4.8	5.0	0.19	0.20
E	3.8	4.0	0.15	0.16
e	1.27		0.050	
H _E	5.80	6.20	0.228	0.244
L	1.05		0.041	
L _p	0.40	1.00	0.016	0.039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

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.

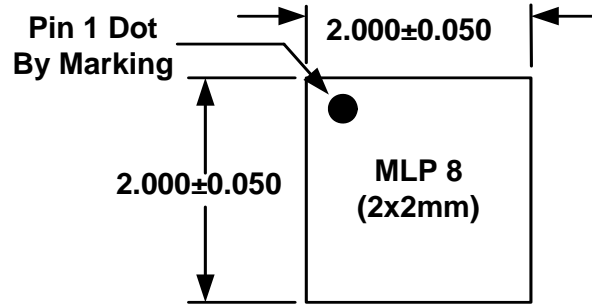
**PACKAGE DIAGRAM
MSOP 8**



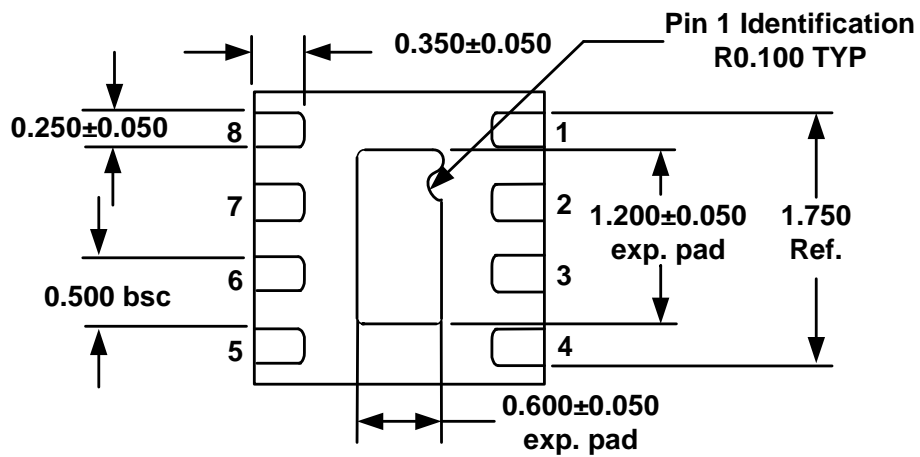
- NOTES:
1. DIMENSIONS D AND E DO NOT INCLUDE MOLD PROTRUSION.
 2. MAXIMUM MOLD PROTRUSION FOR D IS 0.15mm.
 3. MAXIMUM MOLD PROTRUSION FOR E IS 0.25mm.

DIM	MILLIMETERS	
	MIN	MAX
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°

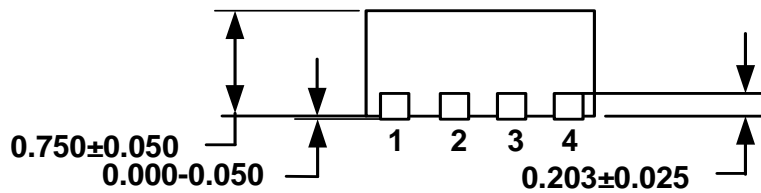
PACKAGE DIAGRAM
MLP 8 2x2mm



TOP VIEW



BOTTOM VIEW



SIDE VIEW

Note: All dimensions are in mm

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