

AZ10EL32 AZ100EL32

ECL/PECL ÷ 2 Divider

FEATURES

- 510ps Propagation Delay
- 3.0GHz Toggle Frequency
- High Bandwidth Output Transitions
- 75kΩ Internal Input Pulldown Resistors
- Direct Replacement for ON Semiconductor MC10EL32 & MC100EL32

PACKAGE AVAILABILITY

PACKAGE	PART NO.	MARKING
SOIC 8	AZ10EL32D	AZM10EL32
SOIC 8 T&R	AZ10EL32DR1	AZM10EL32
SOIC 8 T&R	AZ10EL32DR2	AZM10EL32
SOIC 8	AZ100EL32D	AZM100EL32
SOIC 8 T&R	AZ100EL32DR1	AZM100EL32
SOIC 8 T&R	AZ100EL32DR2	AZM100EL32
TSSOP 8	AZ10EL32T	AZTEL32
TSSOP 8 T&R	AZ10EL32TR1	AZTEL32
TSSOP 8 T&R	AZ10EL32TR2	AZTEL32
TSSOP 8	AZ100EL32T	AZHEL32
TSSOP 8 T&R	AZ100EL32TR1	AZHEL32
TSSOP 8 T&R	AZ100EL32TR2	AZHEL32

DESCRIPTION

The AZ10/100EL32 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 EL32's in a system.

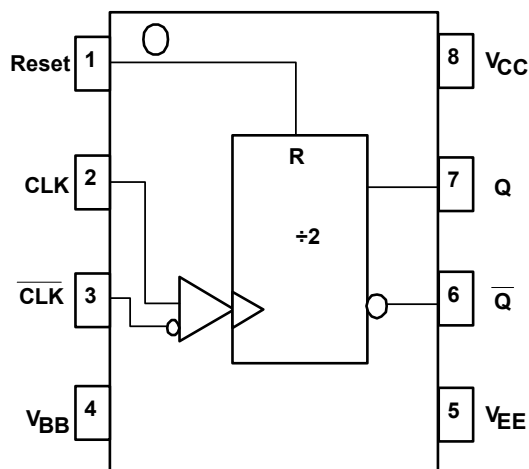
The EL32 provides a V_{BB} output for single-ended use or a DC bias reference for AC coupling to the device. For single-ended input applications, the V_{BB} reference should be connected to one side of the CLK/CLK differential input pair. The input signal is then fed to the other CLK/CLK input. The V_{BB} pin should be used only as a bias for the EL32 as its sink/source capability is limited. When used, the V_{BB} pin should be bypassed to ground via a 0.01μF 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	Asynch Reset
V_{BB}	Reference Voltage Output
Q, \bar{Q}	Data Outputs
V_{CC}	Positive Supply
V_{EE}	Negative Supply



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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 +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} = -4.75V 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	-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
I _{IH}	Input HIGH Current			150			150			150			150	µA
I _{IL}	Input LOW Current	0.5			0.5			0.5			0.5			µA
V _{BB}	Output Reference Voltage	-1430		-1300	-1380		-1270	-1350		-1250	-1310		-1190	mV
I _{EE}	Power Supply Current		25	30		25	30		25	30		25	30	mA

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

10K 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}	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
I _{IH}	Input HIGH Current			150			150			150			150	µA
I _{IL}	Input LOW Current	0.5			0.5			0.5			0.5			µA
V _{BB}	Output Reference Voltage	3570		3700	3620		3730	3650		3750	3690		3810	mV
I _{EE}	Power Supply Current		25	30		25	30		25	30		25	30	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.

100K ECL DC Characteristics (V_{EE} = -4.2V 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	0.5			0.5			0.5			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.

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100K PECL DC Characteristics ($V_{EE} = \text{GND}$, $V_{CC} = +5.0\text{V}$)

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	0.5			0.5			0.5			0.5			μA
V_{BB}	Output Reference Voltage	3620		3740	3620		3740	3620		3740	3620		3740	mV
I_{EE}	Power Supply Current		25	30		25	30		25	30		29	35	mA

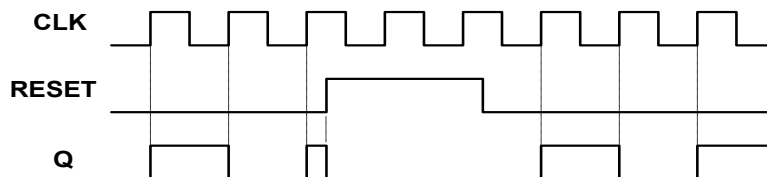
- For supply voltages other than 5.0V, use the ECL table values and ADD supply voltage value.
- Each output is terminated through a 50Ω resistor to $V_{CC} - 2\text{V}$.

AC Characteristics ($V_{EE} = 10\text{E}(-4.75\text{V to } -5.5\text{V})$, $100\text{E}(-4.2\text{V to } -5.5\text{V})$; $V_{CC} = \text{GND}$ or $V_{EE} = \text{GND}$, $V_{CC} = 10\text{E}(+4.75\text{V to } +5.5\text{V})$, $100\text{E}(+4.2\text{V to } +5.5\text{V})$)

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	2.2	3.0		2.6	3.0		2.6	3.0		2.6	3.0		GHz
$t_{\text{PLH}}/t_{\text{PHL}}$	Propagation Delay CLK to Q Reset to Q	360	500	640	410	500	590	420	510	600	450	540	630	ps
		390	540	690	440	540	640	440	540	640	450	550	650	
$V_{\text{PP}}(\text{AC})$	Minimum Input Swing ¹	150			150			150			150			mV
V_{CMR}	Common Mode Range ²	$V_{\text{CC}} - 2.5$		$V_{\text{CC}} - 0.4$	$V_{\text{CC}} - 2.5$		$V_{\text{CC}} - 0.4$	$V_{\text{CC}} - 2.5$		$V_{\text{CC}} - 0.4$	$V_{\text{CC}} - 2.5$		$V_{\text{CC}} - 0.4$	V
t_r / t_f	Output Rise/Fall Times Q (20% - 80%)	100		350	100		350	100		350	100		350	ps

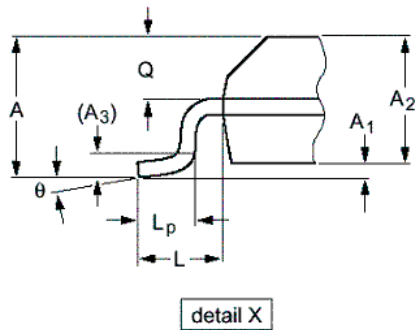
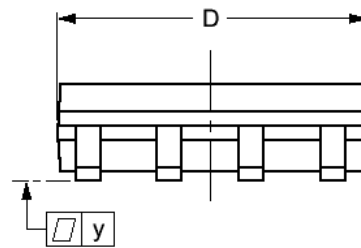
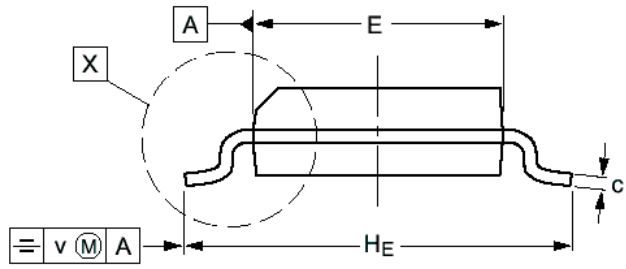
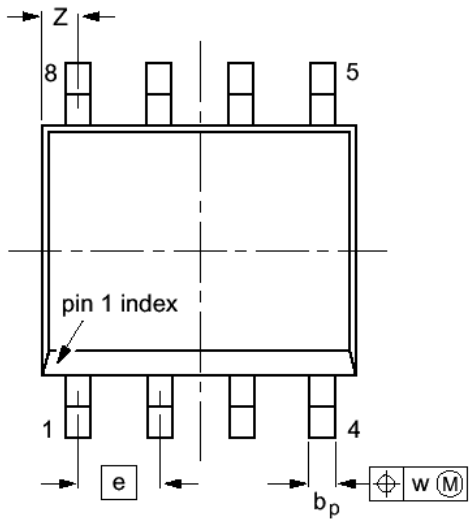
- V_{PP} is the minimum peak-to-peak differential input swing for which AC parameters are guaranteed.
- V_{CMR} is defined as the range within which the V_{IH} level may vary, with the device still meeting the propagation delay specification. The V_{IL} level must be such that the peak-to-peak voltage is less than 1.0V and greater than or equal to $V_{\text{PP}}(\text{min})$.

Figure 1: Timing Diagram



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**PACKAGE DIAGRAM
SOIC 8**



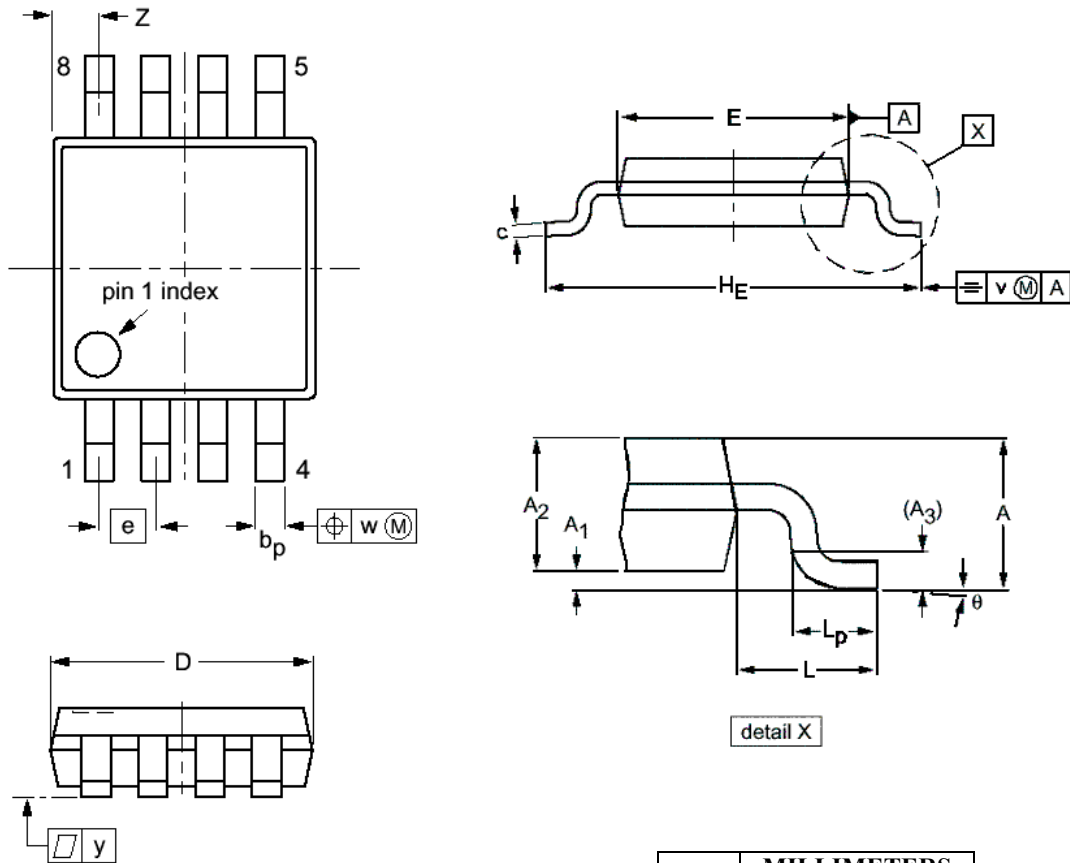
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A		1.75		0.069
A ₁	0.10	0.25	0.004	0.010
A ₂	1.25	1.45	0.049	0.057
A ₃	0.25		0.01	
b _p	0.36	0.49	0.014	0.019
c	0.19	0.25	0.0075	0.0100
D	4.8	5.0	0.19	0.20
E	3.8	4.0	0.15	0.16
e	1.27		0.050	
H _E	5.80	6.20	0.228	0.244
L	1.05		0.041	
L _p	0.40	1.00	0.016	0.039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

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**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°	6°

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