

AZ100LVEL32

PECL/ECL ÷2 Divider

www.azmicrotek.com

DESCRIPTION

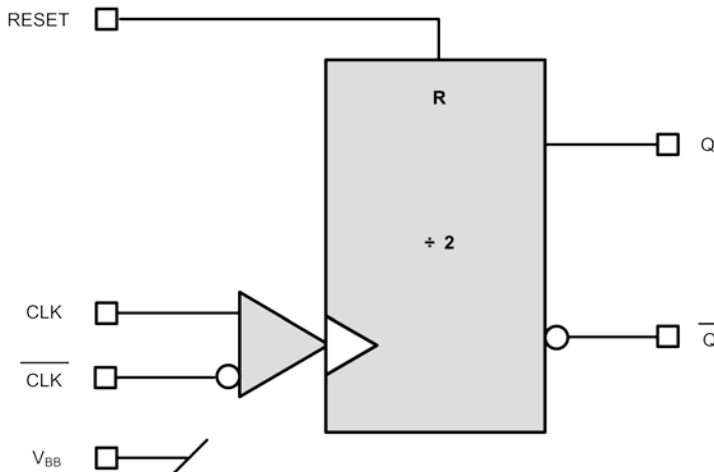
The [AZ100LVEL32](#) is an integrated ÷2 divider. The reset pin is asynchronous and is asserted on the rising edge. Upon power-up, the internal flip-flop will attain a random logic state; the reset allows for the synchronization of multiple AZ100LVEL32's in a system.

The AZ100LVEL32 is a direct replacement for the On Semiconductor MC100EL/LVEL32

FEATURES

- 3.0+ GHz toggle frequency
- 470ps propagation delay
- Internal input pulldown resistors
- 3.0V to 5.5V power supply

BLOCK DIAGRAM



APPLICATIONS

- General Applications

PACKAGE AVAILABILITY

- MLP8
- MSOP8
- SOIC8
- Green/RoHS Compliant/Pb-Free

Part Number (PN)	Package	Marking
AZ100LVEL32NG ¹	MLP 8	C2G <Date Code> ²
AZ100LVEL32TG ¹	MSOP 8	AZHGLV32 ²
AZ100LVEL32DG ¹	SOIC 8	AZM100GLVEL3 ²

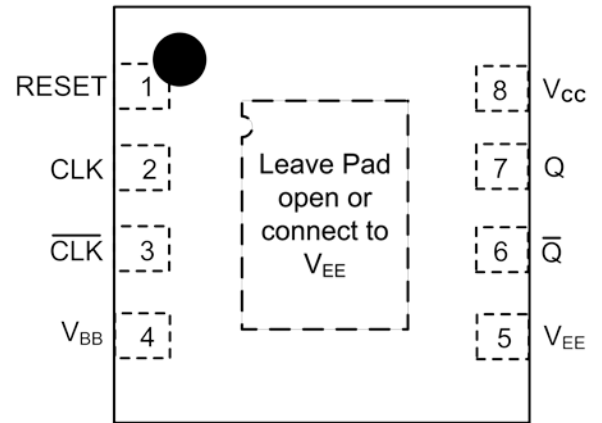
¹ [Tape & Reel](#) - Add 'R1' at end of PN for 7in (1k parts), 'R2' (2.5k) for 13in

² See www.azmicrotek.com for [date code format](#)

PIN DESCRIPTION AND CONFIGURATION

Table 1 - Pin Description for AZ100LEVEL32N

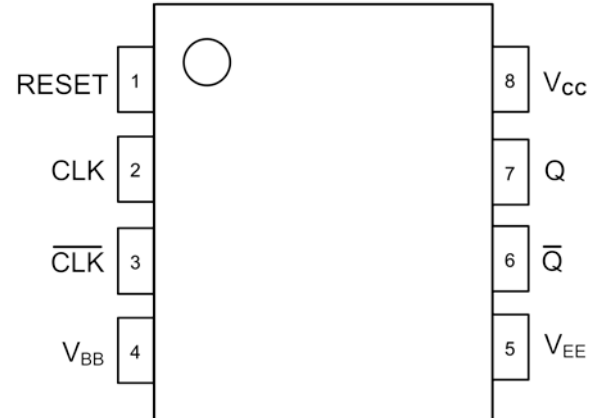
Pin	Name	Type	Function
1	RESET	Input	Asynchronous Reset
2	CLK	Input	Clock Input
3	CLK	Input	Inverting Clock Input
4	V _{BB}	Output	Reference Voltage
5	V _{EE}	Power	Negative Supply
6	Q	Output	Inverting PECL Output
7	Q	Output	PECL Output
8	V _{CC}	Power	Positive Supply



**Figure 1 - Pin Configuration
AZ100LEVEL32N**

Table 2 - Pin Description for AZ100LEVEL32T & AZ100LEVEL32D

Pin	Name	Type	Function
1	RESET	Input	Asynchronous Reset
2	CLK	Input	Clock Input
3	CLK	Input	Inverting Clock Input
4	V _{BB}	Output	Reference Voltage
5	V _{EE}	Power	Negative Supply
6	Q	Output	Inverting PECL Output
7	Q	Output	PECL Output
8	V _{CC}	Power	Positive Supply



**Figure 2 - Pin Configuration
AZ100LEVEL32T & AZ100LEVEL32D**

ENGINEERING NOTES

The AZ100LVEL32 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 AZ100LVEL32 as its sink/source capability is limited. When used, the V_{BB} pin should be bypassed to ground via a $0.01\mu\text{F}$ capacitor.

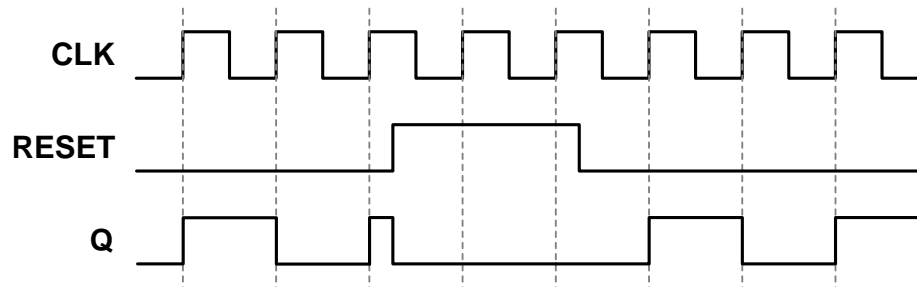


Figure 3 - Timing Diagram

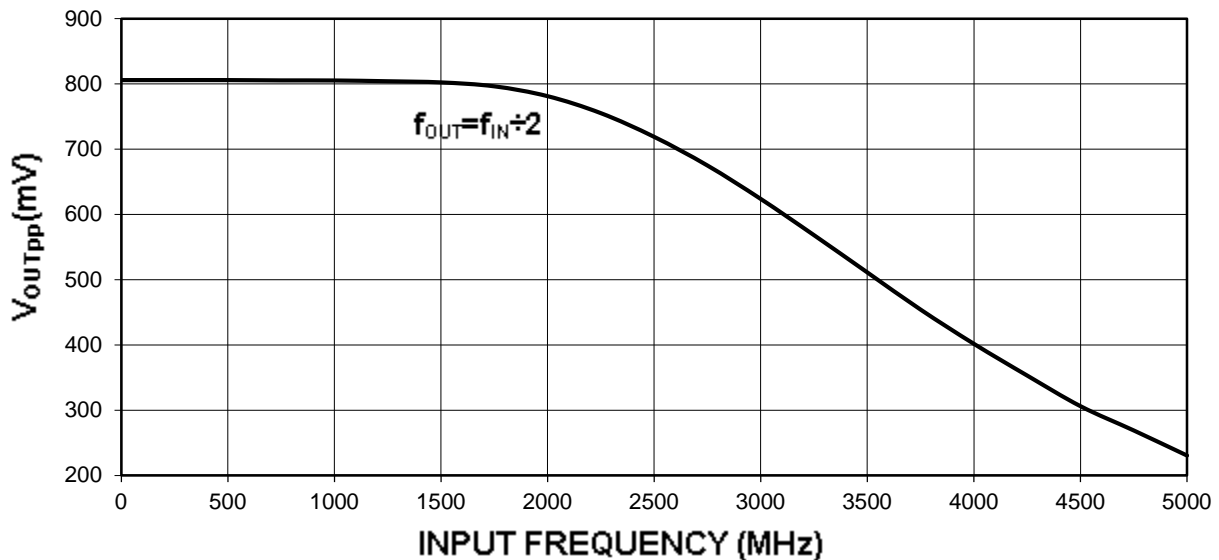


Figure 4 - Typical Large Signal Output Swing

Measured with 750mV input, output terminated to $V_{CC}-2\text{V}$ via 50Ω resistors

PERFORMANCE DATA

Table 3 – Absolute Maximum Ratings

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

Symbol	Characteristic	Condition	Rating	Unit
V _{CC}	PECL Power Supply	V _{EE} = 0V	0 to + 6.0	V
V _{I,PECL}	PECL Input Voltage	V _{EE} = 0V	0 to + 6.0	V
V _{EE}	ECL Power Supply	V _{CC} = 0V	-6.0 to 0	V
V _{I,ECL}	ECL Input Supply	V _{CC} = 0V	-6.0 to 0	V
I _{OUT}	Output Current	Continuous	50	mA
		Surge	100	
T _A	Operating Temperature Range	-	-40 to +85	°C
T _{STG}	Storage Temperature Range	-	-65 to +150	°C
ESD _{HBM}	Human Body Model Electro Static Discharge	-	2500	V
ESD _{MM}	Machine Model Electro Static Discharge	-	200	V
ESD _{CDM}	Charged Device Model Electro Static Discharge	-	2000	V

Table 4 - ECL DC Characteristics

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	Max	Min	Max	Min	Max	Min	Max	
V _{OH}	Output HIGH Voltage ¹	-1085	-880	-1025	-880	-1025	-880	-1025	-880	mV
V _{OL}	Output LOW Voltage ¹	-1830	-1555	-1810	-1620	-1810	-1620	-1810	-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 CLK	-150		-150		-150		-150		µA
	Input LOW Current RESET	0.5		0.5		0.5		0.5		
I _{EE}	Power Supply Current		30		30		30		35	mA

¹ Specified with each output terminated through 50Ω resistors to V_{CC} - 2V.

Table 5 - LVPECL DC Characteristics

LVPECL DC Characteristics ($V_{EE} = \text{GND}$, $V_{CC} = +3.3\text{V}$)

Symbol	Characteristic	-40°C		0°C		25°C		85°C		Unit
		Min	Max	Min	Max	Min	Max	Min	Max	
V_{OH}	Output HIGH Voltage ^{1,2}	2215	2420	2275	2420	2275	2420	2275	2420	mV
V_{OL}	Output LOW Voltage ^{1,2}	1470	1745	1490	1680	1490	1680	1490	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
V_{BB}	Reference Voltage ¹	1920	2040	1920	2040	1920	2040	1920	2040	mV
I_{IH}	Input HIGH Current		150		150		150		150	µA
I_{IL}	Input LOW Current CLK	-150		-150		-150		-150		µA
	Input LOW Current RESET	0.5		0.5		0.5		0.5		
I_{EE}	Power Supply Current		30		30		30		35	mA

¹ For supply voltages other than 3.3V, use the ECL table values and ADD supply voltage value

² Specified with each output terminated through 50Ω resistors to $V_{CC} - 2\text{V}$.

Table 6 - PECL DC Characteristics

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	Max	Min	Max	Min	Max	Min	Max	
V_{OH}	Output HIGH Voltage ^{1,2}	3915	4120	3975	4120	3975	4120	3975	4120	mV
V_{OL}	Output LOW Voltage ^{1,2}	3170	3445	3190	3380	3190	3380	3190	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 CLK	-150		-150		-150		-150		µA
	Input LOW Current RESET	0.5		0.5		0.5		0.5		
I_{EE}	Power Supply Current		30		30		30		35	mA

¹ For supply voltages other than 3.3V, use the ECL table values and ADD supply voltage value

² Specified with each output terminated through 50Ω resistors to $V_{CC} - 2\text{V}$.

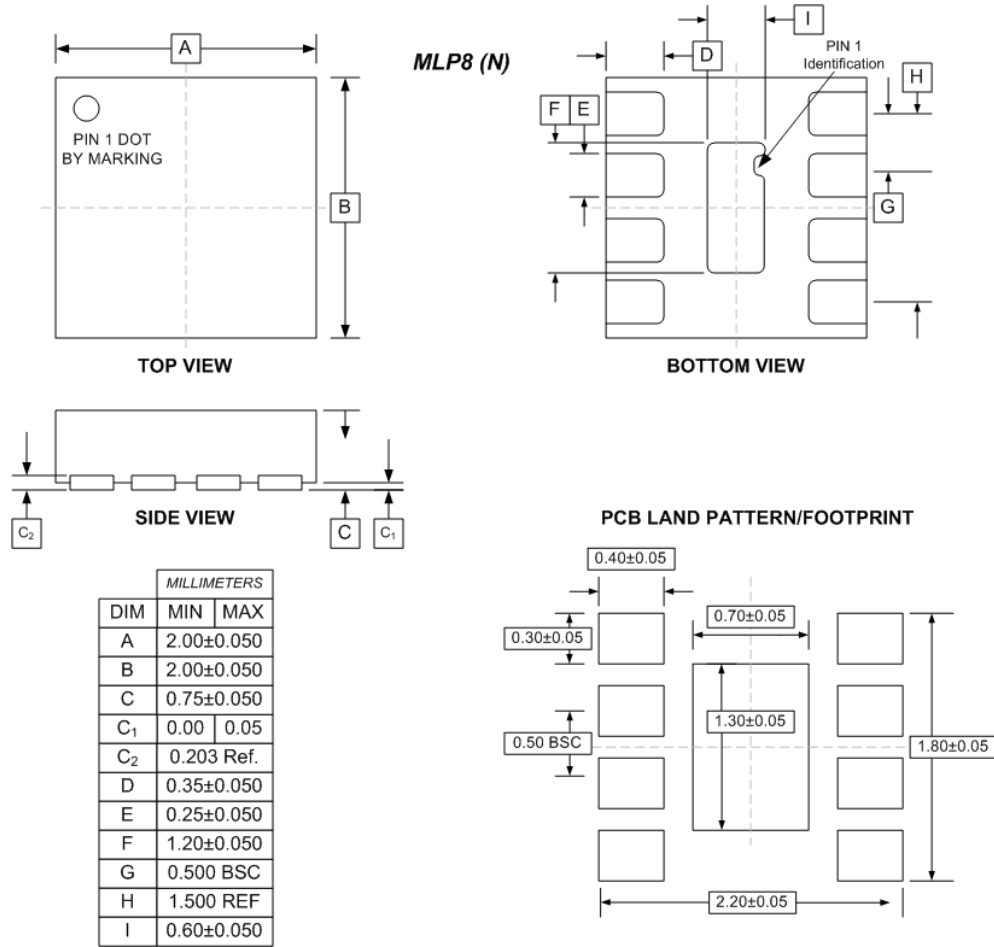
AC Characteristics ($V_{EE} = -3.0V$ to $-5.5V$; $V_{CC}=GND$ or $V_{EE}=GND$; $V_{CC} = +3.0V$ to $+5.5V$)

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/ to Q^1	360	450	540	370	460	550	380	470	560	400	490	580	ps
	RESET to Q^1	390	540	690	440	540	640	440	540	640	450	550	650	ps
t_{SKEW}	Duty Cycle Skew ²		5	20		5	20		5	20		5	20	ps
V_{PP} (AC)	Input Swing ³													
	Differential	150		1000	150		1000	150		1000	150		1000	mV
	Single Ended ⁴	300		2000	300		2000	300		2000	300		2000	mV
V_{CMR}	Common Mode Range ²	V_{EE+}		V_{CC-}	V_{EE+}		V_{CC-}	V_{EE+}		V_{CC-}	V_{EE+}		V_{CC-}	
	$V_{PP} < 500mV$	1.2		0.4	1.1		0.4	1.1		0.4	1.1		0.4	V
	$V_{PP} \geq 500mV$	1.4		0.4	1.3		0.4	1.3		0.4	1.3		0.4	V
t_r/t_f	Output Rise/Fall ¹													
	(20%-80%)	100		260	100		260	100		260	100		260	ps

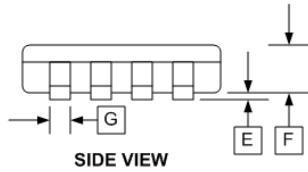
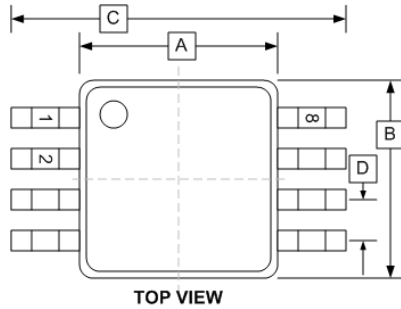
V_{PP} is the peak-to-peak differential input swing for which AC parameters are guaranteed.

- ² 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

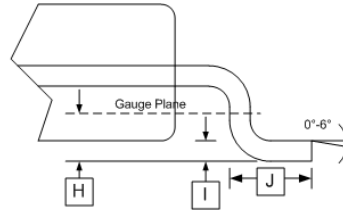
PACKAGE DIAGRAM
MLP8
Green/RoHS compliant/Pb-Free
MSL=1



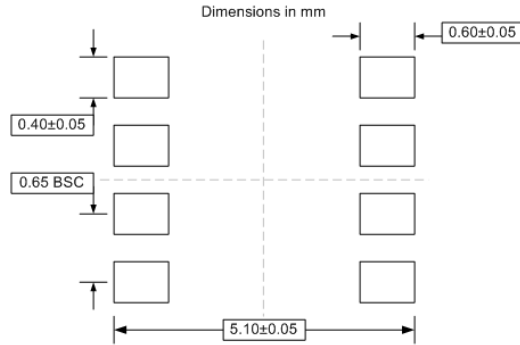
PACKAGE DIAGRAM
MSOP8
 Green/RoHS compliant/Pb-Free
 MSL=1



MSOP8 (T)

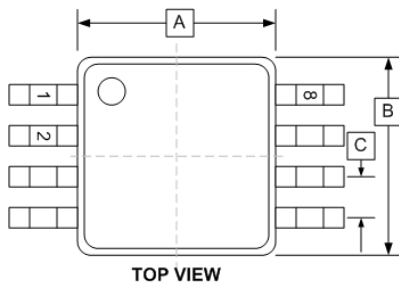


PCB LAND PATTERN/FOOTPRINT

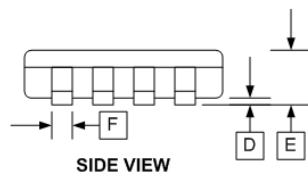
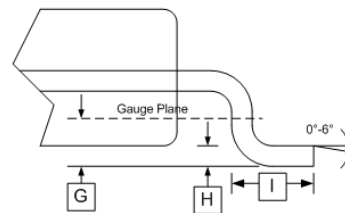


DIM	INCHES	
	MIN	MAX
A	0.118±0.004	
B	0.118±0.004	
C	0.192±0.008	
D	0.0256 TYP	
E	0.004±0.002	
F	0.034±0.002	
G	0.009±0.014	
H	0.010	
I	0.006±0.002	
J	0.021±0.004	

PACKAGE DIAGRAM
SOIC8
Green/RoHS compliant/Pb-Free
MSL=1

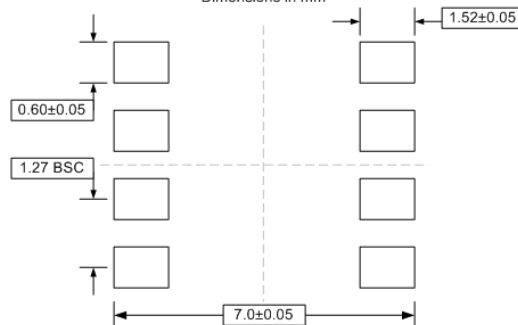


SOIC8 (D)



PCB LAND PATTERN/FOOTPRINT

Dimensions in mm



DIM	INCHES	
	MIN	MAX
A	0.189	0.196
B	0.150	0.157
C	0.050 BSC	
D	0.004	0.01
E	0.054	0.068
F	0.014	0.019
G	0.010	
H	0.0075	0.0098
I	0.016	0.034

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