

# AZ10EL89

## ECL/PECL Coaxial Cable Driver

### FEATURES

- 375ps Propagation Delay
- 1.6V Output Swing
- Internal Input Pulldown Resistors
- Operating Range of 4.2V to 5.7V
- Direct Replacement for ON Semiconductor MC10EL89
- Transistor Count = 29 devices

### PACKAGE AVAILABILITY

PACKAGE	PART NO.	MARKING
SOIC 8	AZ10EL89D	AZM10EL89
SOIC 8 T&R	AZ10EL89DR1	AZM10EL89
SOIC 8 T&R	AZ10EL89DR2	AZM10EL89

### DESCRIPTION

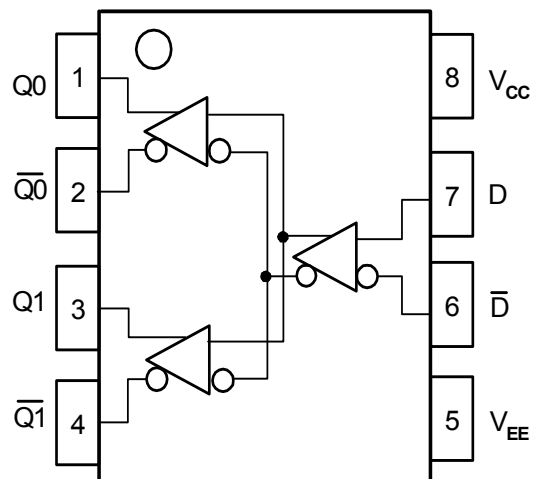
The AZ10EL89 is a differential fanout gate specifically designed to drive coaxial cables. The device is especially useful in Digital Video Broadcasting applications. For this application, since the system is polarity free, each output can be used as an independent driver. The driver has a voltage gain of approximately 40 and produces an output swing twice as large as standard ECL output. When driving a coaxial cable, proper termination is required at both ends of the line to minimize signal loss. The 1.6 V output swing allows for termination at both ends of the cable, while maintaining the required 800 mV swing at the receiving end of the cable. Because of the larger output swings, the device cannot be terminated into the standard  $V_{CC} - 2.0V$ . All of the DC parameters are tested with a  $50\Omega$  to  $V_{CC} - 3.0V$  load. The driver accepts a standard differential ECL input and can run off of the Digital Video Broadcast standard  $-5.0V$  supply. Under open input conditions (pulled to  $V_{EE}$ ) internal input clamps will force the Qn output LOW.

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

### LOGIC DIAGRAM AND PINOUT ASSIGNMENT

#### PIN DESCRIPTION

PIN	FUNCTION
D, $\bar{D}$	Data Inputs
Q0, $\bar{Q}0$ , Q1, $\bar{Q}1$	Data Outputs (1.6V <sub>pp</sub> )
$V_{CC}$	Positive Supply
$V_{EE}$	Negative Supply



# AZ10EL89

**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

## 10K ECL DC Characteristics (V<sub>EE</sub> = -4.2V to -5.7V, 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>	-1230		-980	-1180		-940	-1130		-900	-1060		-810	mV
V <sub>OL</sub>	Output LOW Voltage <sup>1</sup>	-2900		-2580	-2950		-2570	-3000		-2560	-3050		-2510	mV
V <sub>IH</sub>	Input HIGH Voltage	-1230		-890	-1170		-840	-1130		-810	-1060		-720	mV
V <sub>IL</sub>	Input LOW Voltage	-1950		-1500	-1950		-1480	-1950		-1480	-1950		-1445	mV
I <sub>IL</sub>	Input LOW Current	0.5			0.5			0.5			0.5			μA
I <sub>IH</sub>	Input HIGH Current			150			150			150			150	μA
I <sub>EE</sub>	Power Supply Current		23	28		23	28		23	28		23	28	mA

- Each output is terminated through a 50Ω resistor to V<sub>CC</sub> - 3V.

## 10K 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>	3770		4020	3820		4060	3870		4100	3940		4190	mV
V <sub>OL</sub>	Output LOW Voltage <sup>1,2</sup>	2100		2420	2050		2430	2000		2440	1950		2490	mV
V <sub>IH</sub>	Input HIGH Voltage <sup>1</sup>	3770		4110	3830		4160	3870		4190	3940		4280	mV
V <sub>IL</sub>	Input LOW Voltage <sup>1</sup>	3050		3500	3050		3520	3050		3520	3050		3555	mV
I <sub>IL</sub>	Input LOW Current	0.5			0.5			0.5			0.5			μA
I <sub>IH</sub>	Input HIGH Current			150			150			150			150	μA
I <sub>EE</sub>	Power Supply Current		23	28		23	28		23	28		23	28	mA

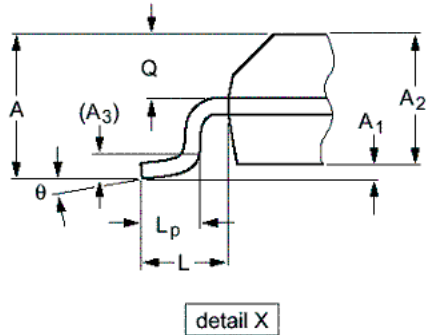
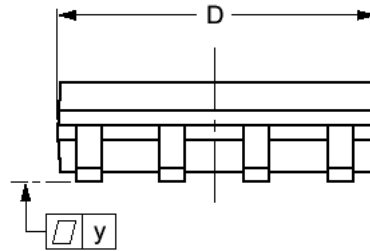
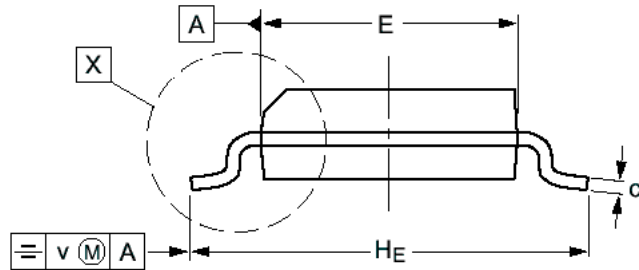
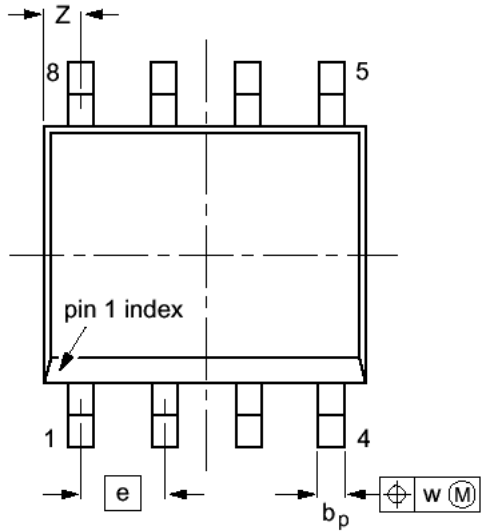
- For supply voltages other than 5.0V, use the ECL table values and ADD supply voltage value.
- Each output is terminated through a 50Ω resistor to V<sub>CC</sub> - 3V.

## AC Characteristics (V<sub>EE</sub> = -4.2V to -5.7V, V<sub>CC</sub> = GND or V<sub>EE</sub> = GND, V<sub>CC</sub> = +4.2V to +5.7V)

Symbol	Characteristic	-40°C			0°C			25°C			85°C			Unit
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
t <sub>max</sub>	Maximum Toggle Rate								1.5					Gb/s
t <sub>PLH</sub> / t <sub>PHL</sub>	Propagation Delay to Output	200	340	480	250	340	430	260	350	440	310	400	490	ps
t <sub>SKEW</sub>	Within-Device Skew <sup>1</sup> Duty Cycle Skew <sup>2</sup>		5	20		5	20		5	20		5	20	ps
V <sub>PP</sub> (AC)	Minimum Input Swing <sup>3</sup>	150			150			150			150			mV
V <sub>CMR</sub>	Common Mode Range <sup>4</sup>	V <sub>EE</sub> + 2.5		V <sub>CC</sub> - 0.4	V <sub>EE</sub> + 2.5		V <sub>CC</sub> - 0.4	V <sub>EE</sub> + 2.5		V <sub>CC</sub> - 0.4	V <sub>EE</sub> + 2.5		V <sub>CC</sub> - 0.4	V
t <sub>r</sub> / t <sub>f</sub>	Output Rise/Fall Times Q (20% - 80%)	205		455	205		455	205		455	205		455	ps

- Within-device skew defined as identical transitions on similar paths through a device.
- Duty cycle skew is the difference between a t<sub>PLH</sub> and t<sub>PHL</sub> propagation delay through a device.
- V<sub>PP</sub> is the minimum peak-to-peak differential input swing for which AC parameters guaranteed. The device has a DC gain of ≈ 40.
- The V<sub>CMR</sub> 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<sub>PP</sub> (min) and 1V.

**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.

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