

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 NUMBER | MARKING | NOTES |
|---------|-------------|-----------|-------|
| SOIC 8 | AZ10EL89D | AZM10EL89 | 1,2 |

- 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 "YWW" on underside of part.

DESCRIPTION

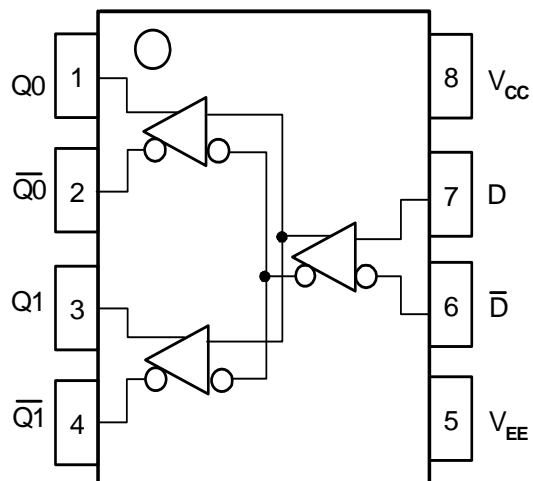
The AZ10EL89 is a differential fanout gate specifically designed to drive coaxial cables. The device is especially useful in Digital Video Broadcasting applications. For this application, since the system is polarity free, each output can be used as an independent driver. The driver has a voltage gain 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 50Ω 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 _{pp}) |
| 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 _{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} = -4.2V to -5.7V, 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 | -1230 | | -980 | -1180 | | -940 | -1130 | | -900 | -1060 | | -810 | mV |
| V _{OL} | Output LOW Voltage ¹ | -2900 | | -2580 | -2950 | | -2570 | -3000 | | -2560 | -3050 | | -2510 | 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 _{IL} | Input LOW Current | 0.5 | | | 0.5 | | | 0.5 | | | 0.5 | | | μA |
| I _{IH} | Input HIGH Current | | | 150 | | | 150 | | | 150 | | | 150 | μA |
| I _{EE} | Power Supply Current | | 23 | 28 | | 23 | 28 | | 23 | 28 | | 23 | 28 | mA |

- Each output is terminated through a 50Ω resistor to V_{CC} - 3V.

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} | 3770 | | 4020 | 3820 | | 4060 | 3870 | | 4100 | 3940 | | 4190 | mV |
| V _{OL} | Output LOW Voltage ^{1,2} | 2100 | | 2420 | 2050 | | 2430 | 2000 | | 2440 | 1950 | | 2490 | 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 _{IL} | Input LOW Current | 0.5 | | | 0.5 | | | 0.5 | | | 0.5 | | | μA |
| I _{IH} | Input HIGH Current | | | 150 | | | 150 | | | 150 | | | 150 | μA |
| I _{EE} | Power Supply Current | | 23 | 28 | | 23 | 28 | | 23 | 28 | | 23 | 28 | mA |

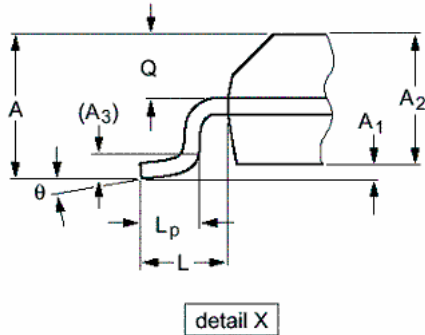
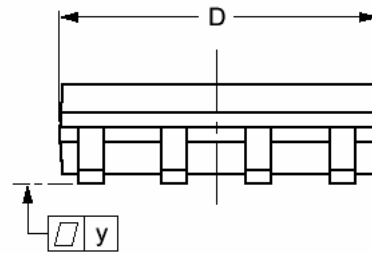
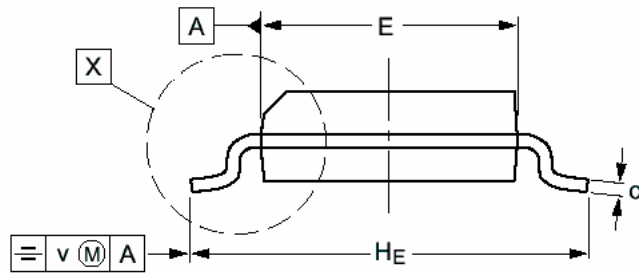
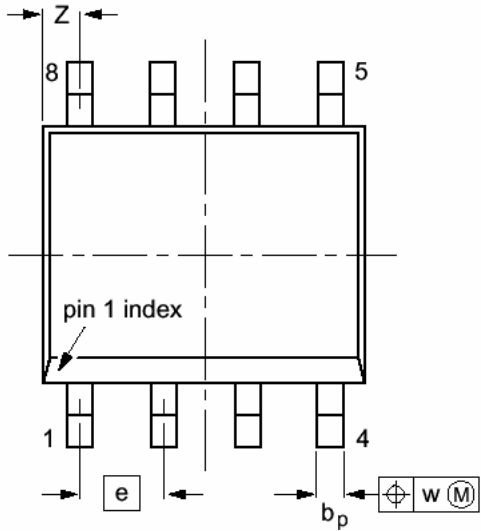
- For supply voltages other than 5.0V, use the ECL table values and ADD supply voltage value.
- Each output is terminated through a 50Ω resistor to V_{CC} - 3V.

AC Characteristics (V_{EE} = -4.2V to -5.7V, V_{CC} = GND or V_{EE} = GND, V_{CC} = +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 _{max} | Maximum Toggle Rate | | | | | | | | 1.5 | | | | | Gb/s |
| t _{PLH} / t _{PHL} | Propagation Delay to Output | 200 | 340 | 480 | 250 | 340 | 430 | 260 | 350 | 440 | 310 | 400 | 490 | ps |
| t _{SKEW} | Within-Device Skew ¹ Duty Cycle Skew ² | | 5 | 20 | | 5 | 20 | | 5 | 20 | | 5 | 20 | ps |
| V _{PP} (AC) | Minimum Input Swing ³ | 150 | | | 150 | | | 150 | | | 150 | | | mV |
| V _{CMR} | Common Mode Range ⁴ | V _{EE} + 2.5 | | V _{CC} - 0.4 | V _{EE} + 2.5 | | V _{CC} - 0.4 | V _{EE} + 2.5 | | V _{CC} - 0.4 | V _{EE} + 2.5 | | V _{CC} - 0.4 | V |
| t _r / t _f | 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_{PLH} and t_{PHL} propagation delay through a device.
- V_{PP} is the minimum peak-to-peak differential input swing for which AC parameters guaranteed. The device has a DC gain of ≈ 40.
- 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.

**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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