

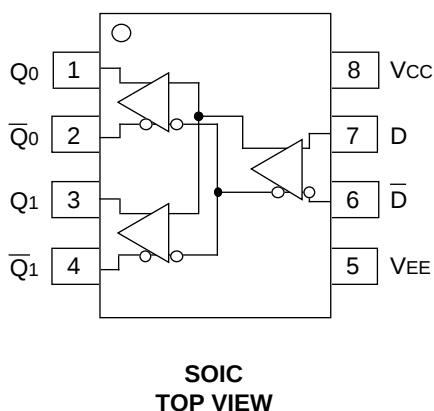
## FEATURES

- 375ps propagation delay
- 1.6V output swings
- Internal 75K $\Omega$  input pull-down resistors
- Available in 8-pin SOIC package

## DESCRIPTION

The SY10EL89 is a differential fanout gate specifically designed to drive coaxial cables. The device is especially useful in Digital Video Broadcast applications. For this application, since the system is polarity-free, each output of the device can be used as an independent driver. The driver boasts a voltage gain of approximately 40 and produces output swings twice as large as a standard ECL output. When driving a coaxial cable, proper termination is required at both ends of the line to minimize signal loss. The 1.6V output swings allow for termination at both ends of the cable while maintaining the required 800mV swing at the receiving end of the cable. Because of the larger output swings, the device cannot be terminated into the standard  $-2.0V$ . All of the DC parameters are tested with a 50 $\Omega$  to  $-3.0V$  load. The driver accepts a standard differential ECL input and can run off the Digital Video Broadcast standard  $-5.0V$  supply.

## PIN CONFIGURATION/BLOCK DIAGRAM



## PIN NAMES

| Pin    | Function     |
|--------|--------------|
| D      | Data Inputs  |
| Q0, Q1 | Data Outputs |

## DC ELECTRICAL CHARACTERISTICS

$V_{EE} = V_{EE} \text{ (Min.) to } V_{EE} \text{ (Max.)}; V_{CC} = \text{GND}$

| Symbol   | Parameter                          | $T_A = -40^\circ\text{C}$ |       |       | $T_A = 0^\circ\text{C}$ |       |       | $T_A = +25^\circ\text{C}$ |       |       | $T_A = +85^\circ\text{C}$ |       |       | Unit          |
|----------|------------------------------------|---------------------------|-------|-------|-------------------------|-------|-------|---------------------------|-------|-------|---------------------------|-------|-------|---------------|
|          |                                    | Min.                      | Typ.  | Max.  | Min.                    | Typ.  | Max.  | Min.                      | Typ.  | Max.  | Min.                      | Typ.  | Max.  |               |
| $I_{EE}$ | Power Supply Current               | 18                        | 23    | 28    | 18                      | 23    | 28    | 18                        | 23    | 28    | 18                        | 23    | 28    | mA            |
| $V_{OH}$ | Output HIGH Voltage <sup>(1)</sup> | -1.23                     | -1.10 | -0.98 | -1.17                   | -1.05 | -0.93 | -1.13                     | -1.02 | -0.90 | -1.06                     | -0.96 | -0.81 | V             |
| $V_{OL}$ | Output LOW Voltage <sup>(1)</sup>  | -2.84                     | -2.72 | -2.58 | -2.84                   | -2.70 | -2.56 | -2.84                     | -2.70 | -2.56 | -2.84                     | -2.67 | -2.51 | V             |
| $V_{EE}$ | Power Supply Voltage               | -4.75                     | —     | -5.5  | -4.75                   | —     | -5.5  | -4.75                     | —     | -5.5  | -4.75                     | —     | -5.5  | V             |
| $I_{IH}$ | Input HIGH Current                 | —                         | —     | 150   | —                       | —     | 150   | —                         | —     | 150   | —                         | —     | 150   | $\mu\text{A}$ |

### NOTE:

1.  $V_{OH}$  and  $V_{OL}$  specified for  $50\Omega$  to  $-3.0\text{V}$  load.

## AC ELECTRICAL CHARACTERISTICS

$V_{EE} = V_{EE} \text{ (Min.) to } V_{EE} \text{ (Max.)}; V_{CC} = \text{GND}$

| Symbol                 | Parameter                             | $T_A = -40^\circ\text{C}$ |      |      | $T_A = 0^\circ\text{C}$ |      |      | $T_A = +25^\circ\text{C}$ |      |      | $T_A = +85^\circ\text{C}$ |      |      | Unit |
|------------------------|---------------------------------------|---------------------------|------|------|-------------------------|------|------|---------------------------|------|------|---------------------------|------|------|------|
|                        |                                       | Min.                      | Typ. | Max. | Min.                    | Typ. | Max. | Min.                      | Typ. | Max. | Min.                      | Typ. | Max. |      |
| $t_{PLH}$<br>$t_{PHL}$ | Propagation Delay to Output D         | 200                       | 340  | 480  | 250                     | 340  | 430  | 260                       | 350  | 440  | 310                       | 400  | 490  | ps   |
| $t_{skew}$             | Within-Device Skew                    | —                         | 5    | 20   | —                       | 5    | 20   | —                         | 5    | 20   | —                         | 5    | 20   | ps   |
| $V_{PP}$               | Minimum Input Swing <sup>(1)</sup>    | 150                       | —    | —    | 150                     | —    | —    | 150                       | —    | —    | 150                       | —    | —    | mV   |
| $V_{CMR}$              | Common Mode Range <sup>(2)</sup>      | (2)                       | —    | -0.4 | (2)                     | —    | -0.4 | (2)                       | —    | -0.4 | (2)                       | —    | -0.4 | V    |
| $t_r$<br>$t_f$         | Output Rise/Fall Times Q (20% to 80%) | 205                       | 330  | 455  | 205                     | 330  | 455  | 205                       | 330  | 455  | 205                       | 330  | 455  | ps   |

### NOTES:

1. Minimum input swing for which AC parameters are guaranteed. The device has a DC gain of  $\approx 40$ .
2. The 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  $V_{PP} \text{ (Min.)}$  and  $1\text{V}$ . The lower end of the CMR range is dependent on  $V_{EE}$  and is equal to  $V_{EE} + 2.5\text{V}$ .

DC BLOCKING CAPACITORS

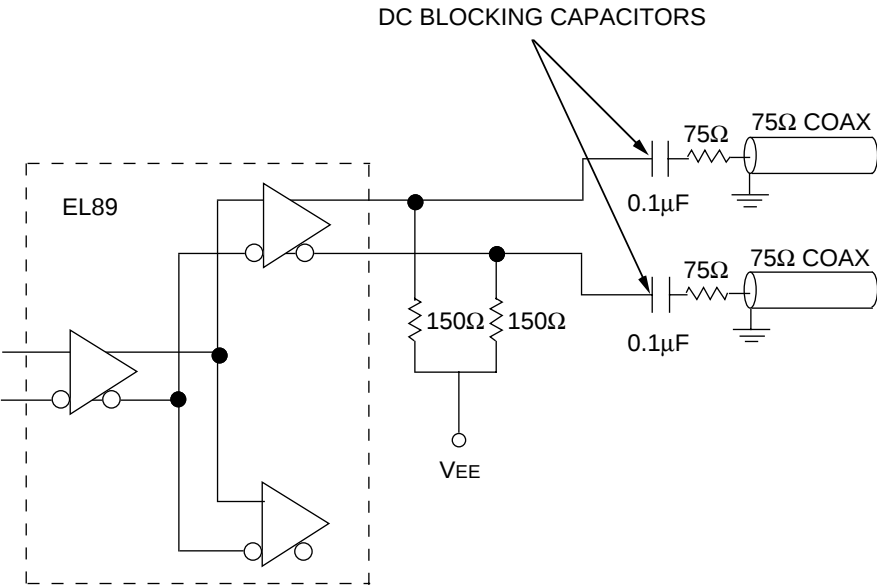


Figure 1. Termination Configuration

PRODUCT ORDERING CODE

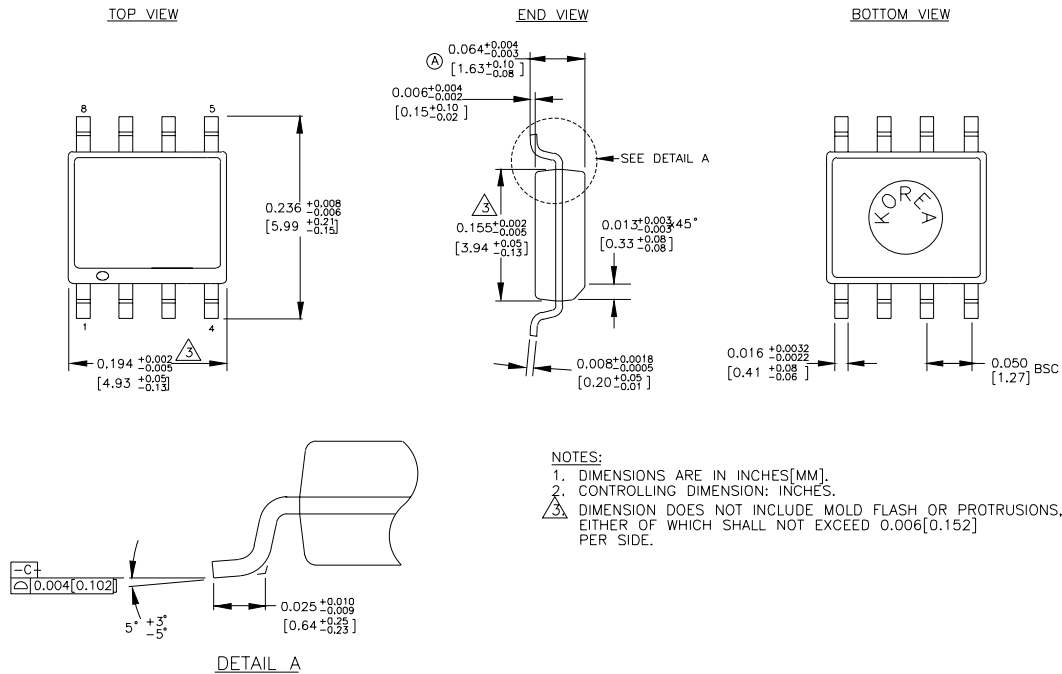
| Ordering Code | Package Type | Operating Range | Marking Code |
|---------------|--------------|-----------------|--------------|
| SY10EL89ZC    | Z8-1         | Commercial      | HEL89        |
| SY10EL89ZCTR* | Z8-1         | Commercial      | HEL89        |

| Ordering Code                | Package Type | Operating Range | Marking Code |
|------------------------------|--------------|-----------------|--------------|
| SY10EL89ZI <sup>(1)</sup>    | Z8-1         | Industrial      | HEL89        |
| SY10EL89ZITR <sup>*(1)</sup> | Z8-1         | Industrial      | HEL89        |

\*Tape and Reel

**Note 1.** Recommended for new designs.

# 8 LEAD SOIC .150" WIDE (Z8-1)



Rev. 03

**MICREL, INC. 1849 FORTUNE DRIVE SAN JOSE, CA 95131 USA**

TEL + 1 (408) 944-0800 FAX + 1 (408) 944-0970 WEB <http://www.micrel.com>

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**Телефон:** +7 812 627 14 35

**Электронная почта:** [sales@st-electron.ru](mailto:sales@st-electron.ru)

**Адрес:** 198099, Санкт-Петербург,  
Промышленная ул, дом № 19, литера Н,  
помещение 100-Н Офис 331