

### FEATURES

- Up to 1.25Gbps operation
- 25mA peak drive current
- Adjustable output current
- Separate output enable
- Differential inputs for data
- 75K $\Omega$  input pull-down resistor
- Single power supply
- Available in a tiny 10-pin MSOP

### DESCRIPTION

The SY100ELT982 is a high speed PECL-to-CML translator. The output current is DC current controlled by  $I_{RSET}$ , current through the resistor  $R_{SET}$ . The output  $\overline{OUT}$  is LOW when output enable is HIGH.

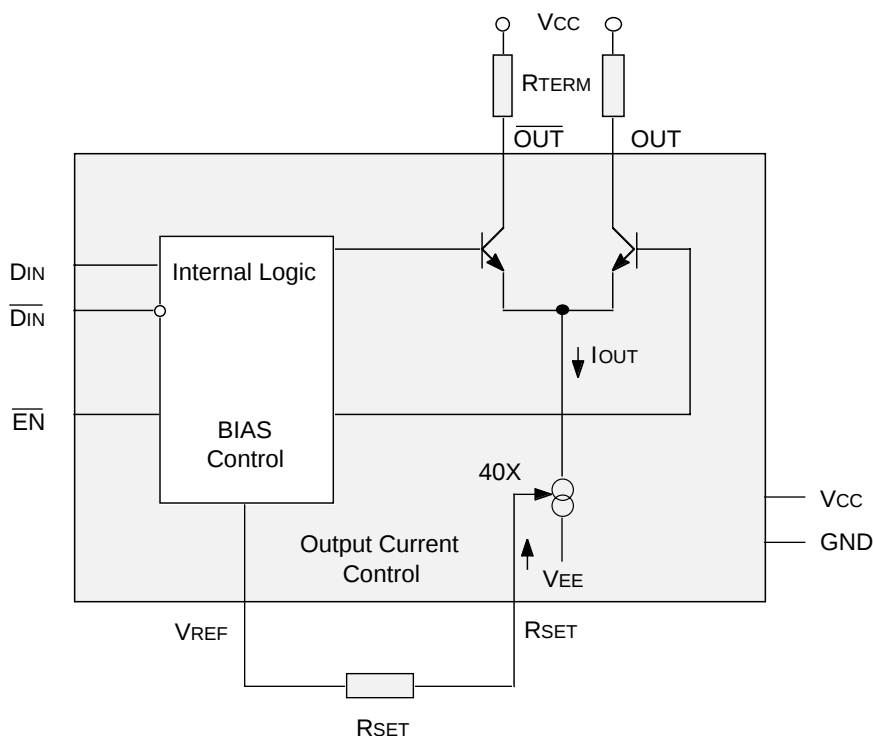
The device incorporates complementary open collector outputs with a capability of driving peak current of 25mA.

The SY100ELT982 utilizes the high performance bipolar ASSET™ technology.

### APPLICATIONS

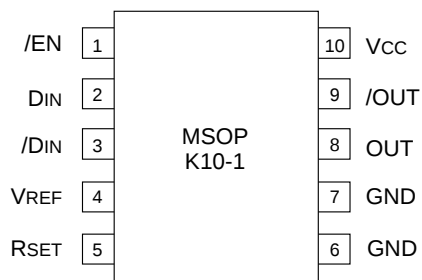
- Telecommunications
- CML output oscillator
- GaAS interface

### BLOCK DIAGRAM



## PACKAGE/ORDERING INFORMATION

### Ordering Information<sup>(1)</sup>



**10-Pin MSOP (K10-1)**

| Part Number                       | Package Type | Operating Range | Package Marking                             | Lead Finish    |
|-----------------------------------|--------------|-----------------|---------------------------------------------|----------------|
| SY100ELT982KC                     | K10-1        | Commercial      | XEL982                                      | Sn-Pb          |
| SY100ELT982KCTR <sup>(2)</sup>    | K10-1        | Commercial      | XEL982                                      | Sn-Pb          |
| SY100ELT982KI                     | K10-1        | Industrial      | XEL982                                      | Sn-Pb          |
| SY100ELT982KITR <sup>(2)</sup>    | K10-1        | Industrial      | XEL982                                      | Sn-Pb          |
| SY100ELT982KG <sup>(3)</sup>      | K10-1        | Industrial      | XEL982 with Pb-Free bar-line indicator      | Pb-Free NiPdAu |
| SY100ELT982KGTR <sup>(2, 3)</sup> | K10-1        | Industrial      | XEL982 with with Pb-Free bar-line indicator | Pb-Free NiPdAu |

**Notes:**

1. Contact factory for die availability. Dice are guaranteed at  $T_A = 25^\circ\text{C}$ , DC Electricals only.
2. Tape and Reel.
3. Pb-Free package is recommended for new designs.

**PIN NAMES**

| Pin       | Function                                                                                                     |
|-----------|--------------------------------------------------------------------------------------------------------------|
| VCC       | Most positive power supply input, +5V for PECL operation.                                                    |
| GND       | Ground                                                                                                       |
| DIN, /DIN | Differential PECL 100K compatible inputs.                                                                    |
| /EN       | This PECL 100K compatible input enables data translation. When Enable asserted HIGH, OUT = IOUT, /OUT = 0mA. |
| OUT, /OUT | Open collector outputs from the output buffer drive these differential current outputs.                      |
| VREF      | Voltage reference for use with RSET.                                                                         |
| RSET      | External resistor to adjust output current.                                                                  |

**TRUTH TABLE<sup>(1)</sup>**

| D | /D | /EN | OUT <sup>(2)</sup> | /OUT <sup>(3)</sup> |
|---|----|-----|--------------------|---------------------|
| L | H  | L   | L                  | H                   |
| H | L  | L   | H                  | L                   |
| X | X  | H   | L                  | H                   |

**NOTE:**

1. L = LOW, H = HIGH, X = don't care
2. H = IOUT = 0mA
3. H = /IOUT = 0mA

**ABSOLUTE MAXIMUM RATINGS<sup>(1)</sup>**

| Symbol | Rating                               | Value           | Unit |
|--------|--------------------------------------|-----------------|------|
| VCC    | Power Supply Voltage                 | 0 to +7.0       | V    |
| Vi     | Input Voltage                        | 0 to +6.0       | V    |
| Io     | Output Current                       | 25              | mA   |
| TLEAD  | Lead Temperature (soldering, 20sec.) | +260            | °C   |
| TA     | Operating Temperature Range          | 0°C to +85°C    | °C   |
| Tstore | Storage Temperature Range            | -55°C to +125°C | °C   |
| Ptot   | Power Dissipation                    | 250             | mW   |

**Note:**

1. Permanent device damage may occur if absolute maximum ratings are exceeded. This is a stress rating only and functional operation is not implied at conditions other than those detailed in the operational sections of this data sheet. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

**OPERATIONING CONDITIONS<sup>(1)</sup>**

| Symbol | Rating                                                  | Value          | Unit |
|--------|---------------------------------------------------------|----------------|------|
| VCC    | Power Supply Voltage                                    | +4.5 to +5.5   | V    |
| RTERM  | Resistor to Terminate Outputs                           | 10 to 50       | Ω    |
| RSET   | Resistor to Adjust Current                              | 1500 to 50,000 | Ω    |
| θJA    | Thermal Resistance of Package to Ambient <sup>(2)</sup> | 206            | °C/W |
| COU    | Capacitance on OUT + /OUT                               | 2.5 typical    | pf   |

**Notes:**

1. The voltage drop across RTERM should not be greater than 2V.
2. Still air without heatsink.

**DC ELECTRICAL CHARACTERISTICS**GND = 0V; VCC = +5.0V  $\pm 10\%$ ; TA = 0°C to + 85°C

| Symbol            | Parameter                                            | TA = 0°C  |      |           | TA = +25°C |      |           | TA = +85°C |      |           | Unit |
|-------------------|------------------------------------------------------|-----------|------|-----------|------------|------|-----------|------------|------|-----------|------|
|                   |                                                      | Min.      | Typ. | Max.      | Min.       | Typ. | Max.      | Min.       | Typ. | Max.      |      |
| V <sub>IH</sub>   | Input HIGH Voltage<br>(Din, /Din, /EN)               | VCC -1165 | —    | VCC -880  | VCC -1165  | —    | VCC -880  | VCC -1165  | —    | VCC -880  | mV   |
| V <sub>IL</sub>   | Input LOW Voltage<br>(Din, /Din, /EN)                | VCC -1810 | —    | VCC -1475 | VCC -1810  | —    | VCC -1475 | VCC -1810  | —    | VCC -1475 | mV   |
| V <sub>REF</sub>  | Reference Voltage                                    | —         | 3.12 | —         | —          | 3.00 | —         | —          | 2.80 | —         | V    |
| I <sub>IL</sub>   | Input LOW Current <sup>(1)</sup><br>(Din, /Din, /EN) | 0.5       | —    | —         | 0.5        | —    | —         | 0.5        | —    | —         | uA   |
| I <sub>IH</sub>   | Input HIGH Current<br>(Din, /Din, /EN)               | —         | —    | 100       | —          | —    | 100       | —          | —    | 100       | uA   |
| I <sub>CC</sub>   | Supply Current <sup>(2)</sup>                        | —         | 16   | 25        | —          | 16   | 25        | —          | 16   | 25        | mA   |
| I <sub>OL</sub>   | Output LOW Current<br>(/EN = HIGH)                   | —         | —    | 500       | —          | —    | 500       | —          | —    | 500       | uA   |
| I <sub>OR</sub>   | Output Current<br>Ringing <sup>(2)</sup>             | —         | —    | 10        | —          | —    | 10        | —          | —    | 10        | %    |
| I <sub>GAIN</sub> | I <sub>OUT</sub> /I <sub>RSET</sub>                  | 30        | 38   | 44        | 30         | 38   | 44        | 30         | 38   | 44        | —    |

**Notes:**

1. V<sub>I</sub> = V<sub>IL</sub>(Min.)
2. I<sub>OH</sub> = 25mA.

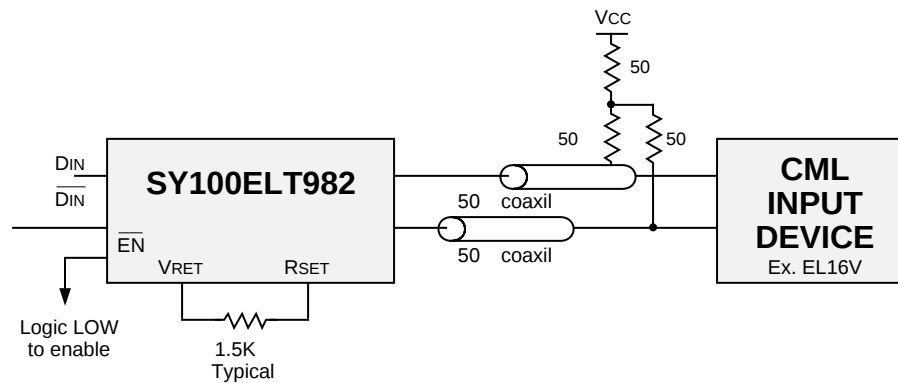
**AC ELECTRICAL CHARACTERISTICS<sup>(1)</sup>**I<sub>OH</sub> = 10mA; GND = 0V; VCC = +5V  $\pm 10\%$ ; TA = 0°C to + 85°C

| Symbol                           | Parameter                                | TA = 0°C |      |       | TA = +25°C |      |       | TA = +85°C |      |       | Unit | Conditions |
|----------------------------------|------------------------------------------|----------|------|-------|------------|------|-------|------------|------|-------|------|------------|
|                                  |                                          | Min.     | Typ. | Max.  | Min.       | Typ. | Max.  | Min.       | Typ. | Max.  |      |            |
| t <sub>pd</sub> D                | Propagation Delay<br>Din - OUT           | —        | 480  | 1000  | —          | 480  | 1000  | —          | 480  | 1000  | ps   |            |
| t <sub>pd</sub> EN               | Propagation Delay<br>/EN - OUT           | —        | 450  | 1000  | —          | 450  | 1000  | —          | 450  | 1000  | ps   |            |
| t <sub>r</sub><br>t <sub>f</sub> | Rise/Fall Time<br>(20% to 80%)           | —        | 200  | —     | —          | 200  | —     | —          | 200  | —     | ps   |            |
| I <sub>OUT</sub>                 | Output Current                           | 5        | 15   | 25    | 5          | 15   | 25    | 5          | 15   | 25    | mA   |            |
| I <sub>RSET</sub>                | Output Current Control                   | 0.125    | —    | 0.625 | 0.125      | —    | 0.625 | 0.125      | —    | 0.625 | mA   |            |
| I <sub>OR</sub>                  | Output Current<br>Ringing <sup>(2)</sup> | —        | —    | 10    | —          | —    | 10    | —          | —    | 10    | %    |            |

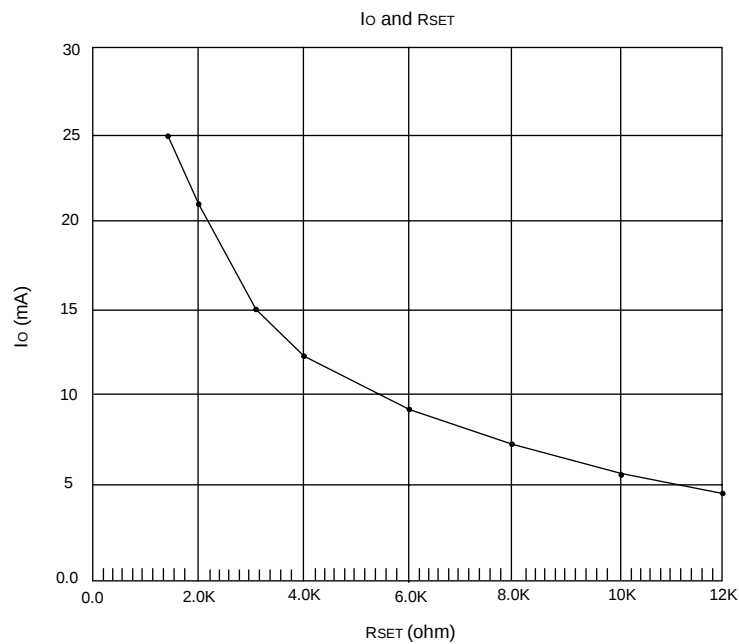
**Notes:**

1. R<sub>TERM</sub> = 50Ω  $\pm 1\%$
2. I<sub>OH</sub> = 5 to 25mA

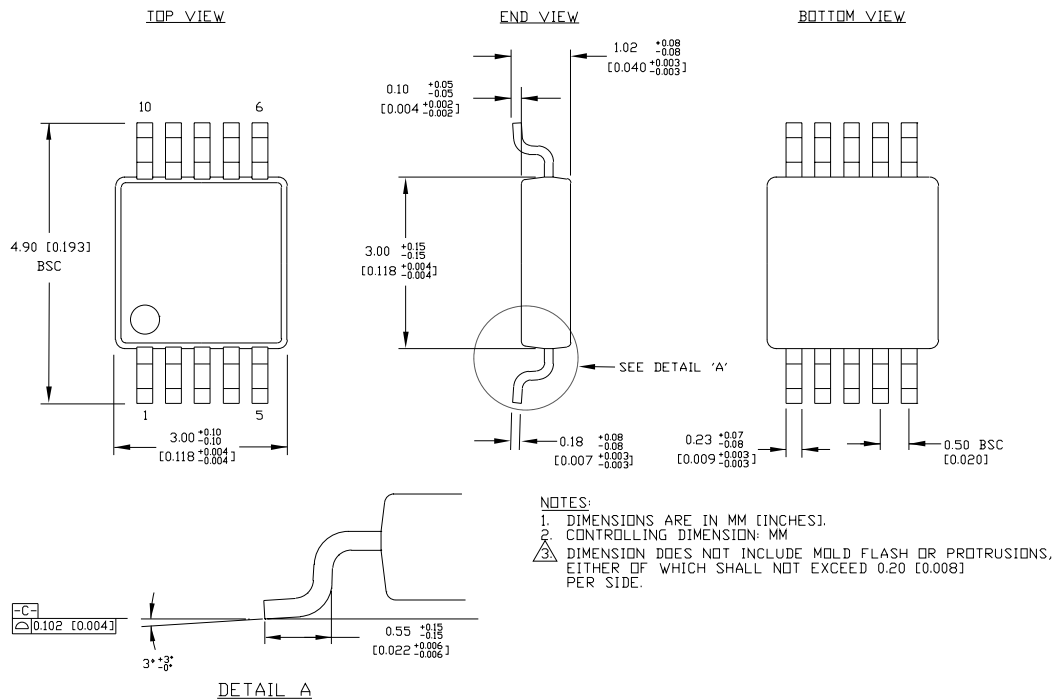
## APPLICATION EXAMPLE



## PERFORMANCE CURVES



# 10-PIN MSOP (K10-1)



Rev. 00

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