

FEATURES

- 3.3V and 5V power supply options
- High bandwidth output transitions
- Internal 75KΩ pull-down resistors on inputs
- Functionally equivalent to SY100EL16V with variable output swing
- Improved output waveform characteristics
- Available in 8-pin SOIC and 8-pin (3mm) MSOP

DESCRIPTION

The SY100EL16VS are differential receivers with variable output swing. The devices are functionally equivalent to the EL16V devices with an input that control the amplitude of the outputs.

The operational range of the EL16VS control input is from VBB (max. swing) to VCC (min. swing). Simple control of the output swing can be obtained by a variable resistor between the VBB pin and VCC with the wiper driving VCTRL.

The EL16VS provides a VBB output for either single-ended use or as a DC bias for AC coupling to the device. The VBB pin should be used only as a bias for the EL16VS as its current sink/source capability is limited. Whenever used, the VBB pin should be bypassed to ground via a 0.01μF capacitor.

Under open input conditions (pulled to VEE), internal input clamps will force the Q output LOW.

PIN NAMES

| Pin | Function |
|-------|--------------------------|
| D | Data Inputs |
| Q | Data Outputs |
| VBB | Reference Voltage Output |
| VCTRL | Output Swing Control |

TYPICAL VOLTAGE OUTPUT SWING

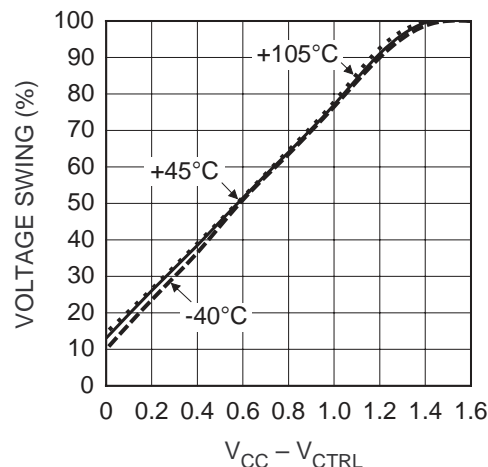
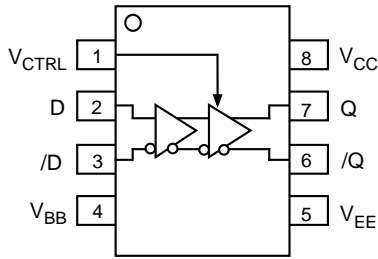


Figure 1. Typical Voltage Output Swing
Vcc = 3.3V or 5V

PACKAGE/ORDERING INFORMATION



8-Pin SOIC and 8-PinMSOP

Ordering Information⁽¹⁾

| Part Number | Package Type | Operating Range | Package Marking | Lead Finish |
|-----------------------------------|--------------|-----------------|--|----------------|
| SY100EL16VSKC | K8-1 | Commercial | XLEL16VS | Sn-Pb |
| SY100EL16VSKCTR ⁽²⁾ | K8-1 | Commercial | XLEL16VS | Sn-Pb |
| SY100EL16VSZC | Z8-1 | Commercial | XEL16VS | Sn-Pb |
| SY100EL16VSZCTR ⁽²⁾ | Z8-1 | Commercial | XEL16VS | Sn-Pb |
| SY100EL16VSKI | K8-1 | Industrial | XLEL16VS | Sn-Pb |
| SY100EL16VSKITR ⁽²⁾ | K8-1 | Industrial | XLEL16VS | Sn-Pb |
| SY100EL16VSZI | Z8-1 | Industrial | XEL16VS | Sn-Pb |
| SY100EL16VSZITR ⁽²⁾ | Z8-1 | Industrial | XEL16VS | Sn-Pb |
| SY100EL16VSKG ⁽³⁾ | K8-1 | Industrial | XLEL16VS with Pb-Free bar-line indicator | Pb-Free NiPdAu |
| SY100EL16VSKGTR ^(2, 3) | K8-1 | Industrial | XLEL16VS with Pb-Free bar-line indicator | Pb-Free NiPdAu |
| SY100EL16VSZG ⁽³⁾ | Z8-1 | Industrial | XEL16VS with Pb-Free bar-line indicator | Pb-Free NiPdAu |
| SY100EL16VSZGTR ^(2, 3) | Z8-1 | Industrial | XEL16VS with Pb-Free bar-line indicator | Pb-Free NiPdAu |

Notes:

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

DC ELECTRICAL CHARACTERISTICS⁽¹⁾V_{EE} = V_{EE} (Min.) to V_{EE} (Max.); V_{CC} = GND

| Symbol | Parameter | T _A = -40°C | | | T _A = 0°C | | | T _A = +25°C | | | T _A = +85°C | | | Unit |
|-----------------|--|------------------------|------|-------|----------------------|------|-------|------------------------|-------|-------|------------------------|------|-------|------|
| | | Min. | Typ. | Max. | Min. | Typ. | Max. | Min. | Typ. | Max. | Min. | Typ. | Max. | |
| I _{EE} | Power Supply Current | — | 18 | 22 | 9 | 18 | 22 | 9 | 18 | 22 | 9 | 21 | 26 | mA |
| V _{BB} | Output Reference Voltage | -1.38 | — | -1.26 | -1.38 | — | -1.26 | -1.38 | — | -1.26 | -1.38 | — | -1.26 | V |
| I _{IH} | Input HIGH Current | — | — | 150 | — | — | 150 | — | — | 150 | — | — | 150 | μA |
| | -D, \bar{D} -V _{CTRL} | — | — | 40 | — | — | 40 | — | — | 40 | — | — | 40 | |
| V _{OL} | Output LOW Voltage ⁽²⁾ V _{CTRL} = V _{BB} | -1890 | — | -1620 | -1870 | — | -1680 | -1870 | -1775 | -1680 | -1870 | — | -1680 | mV |
| V _{OL} | Output LOW Voltage ⁽²⁾ V _{CTRL} = V _{CC} | -1180 | — | -975 | -1135 | — | -990 | -1135 | -1065 | -990 | -1135 | — | -990 | mV |
| V _{OH} | Output HIGH Voltage ⁽³⁾ | -1085 | — | -880 | -1025 | — | -880 | -1025 | -955 | -880 | -1025 | — | -880 | mV |

NOTES:

- Parametric values specified at: 100EL16VS Series: -3.0V to -5.5V.
- If V_{CTRL} is an open circuit, use the V_{OH} (max. & min.) and V_{OL} (V_{CTRL} = V_{BB}: max only) limits.
- V_{CC} ≤ V_{CTRL} ≤ V_{EE}.

AC ELECTRICAL CHARACTERISTICS⁽¹⁾V_{EE} = V_{EE} (Min.) to V_{EE} (Max.); V_{CC} = GND

| Symbol | Parameter | T _A = -40°C | | | T _A = 0°C | | | T _A = +25°C | | | T _A = +85°C | | | Unit |
|----------------------------------|--|------------------------|------|------|----------------------|------|------|------------------------|------|------|------------------------|------|------|------|
| | | Min. | Typ. | Max. | Min. | Typ. | Max. | Min. | Typ. | Max. | Min. | Typ. | Max. | |
| t _{PLH} | Propagation Delay to Output | 175 | — | 325 | 175 | — | 325 | 175 | — | 325 | 205 | — | 355 | ps |
| t _{PHL} | D (Diff) D (SE) | 125 | 250 | 425 | 125 | 250 | 375 | 125 | 250 | 375 | 155 | 280 | 405 | |
| t _{skew} | Duty Cycle Skew ⁽²⁾ (Diff) | — | 5 | — | — | 5 | 20 | — | 5 | 20 | — | 5 | 20 | ps |
| V _{PP} | Minimum Input Swing ⁽³⁾ | 150 | — | — | 150 | — | — | 150 | — | — | 150 | — | — | mV |
| V _{CMR} | Common Mode Range ⁽⁴⁾ | -1.3 | — | -0.4 | -1.4 | — | -0.4 | -1.4 | — | -0.4 | -1.4 | — | -0.4 | V |
| t _r t _f | Output Rise/Fall Times Q (20% to 80%) | — | 160 | 260 | — | 160 | 260 | — | 160 | 260 | — | 160 | 260 | ps |

NOTES:

- Parametric values specified at: 100EL16VS Series: -3.0V to -5.5V.
- Duty cycle skew is the difference between a t_{PLH} and t_{PHL} propagation delay through a device.
- Minimum input swing for which AC parameters are guaranteed. The device has a DC gain of ≈40 when output has a full swing.
- 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} min. and 1V. The lower end of the CMR range varies 1:1 with V_{EE}. The numbers in the spec table assume a nominal V_{EE} = -3.3V. Note for PECL operation, the V_{CMR} (min) will be fixed at 3.3V - |V_{CMR} (min)|.

APPLICATION IMPLEMENTATION

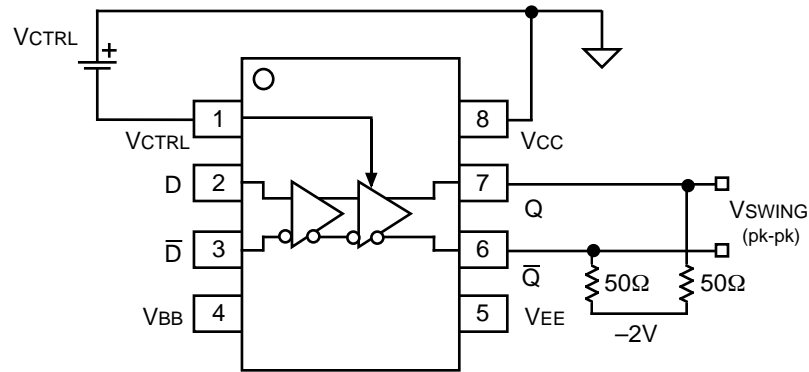


Figure 2. Voltage Source Implementation

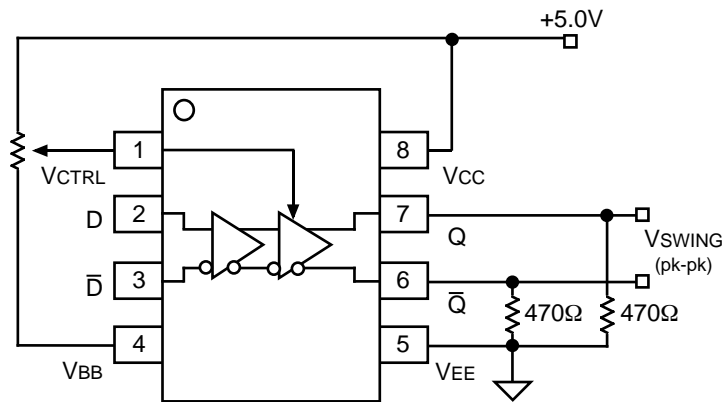
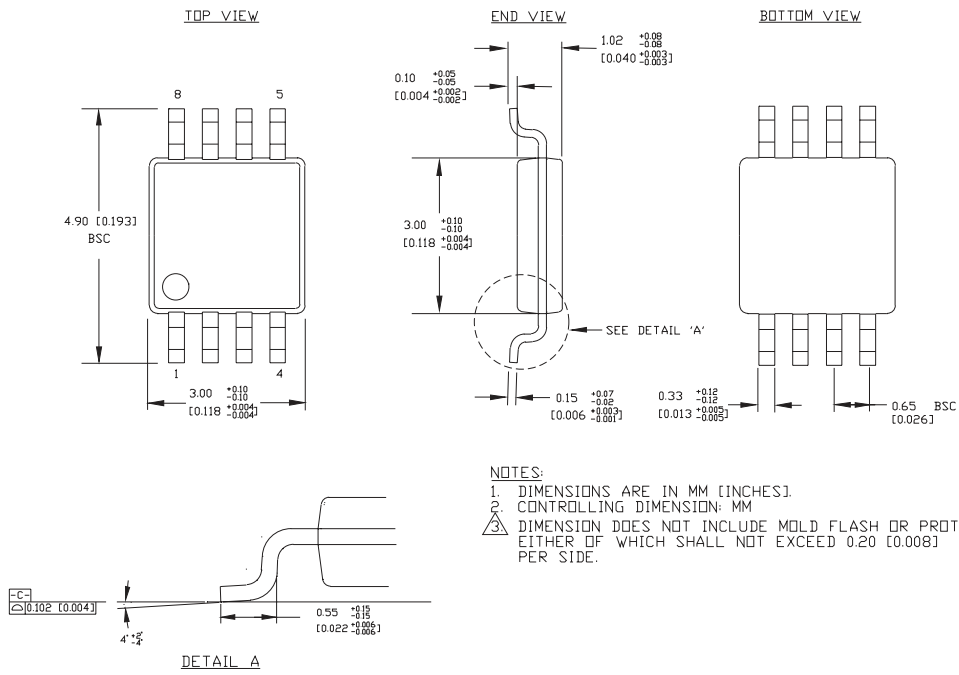


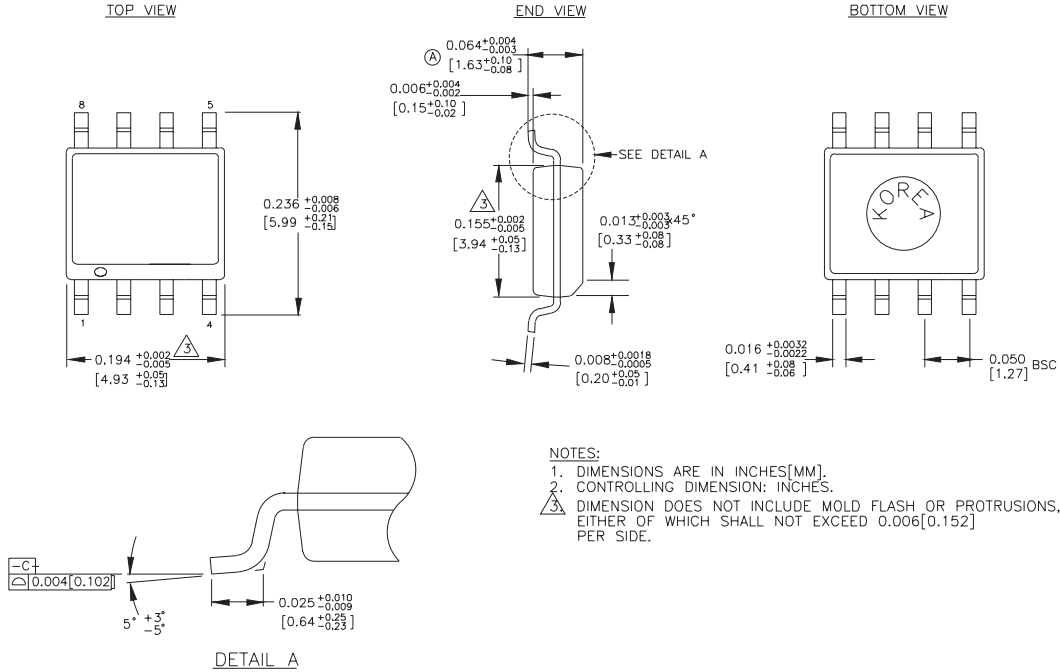
Figure 3. Alternative Implementation

8-PIN MSOP (K8-1)



- NOTES:**
1. DIMENSIONS ARE IN MM [INCHES].
 2. CONTROLLING DIMENSION: MM
- ⚠ DIMENSION DOES NOT INCLUDE MOLD FLASH OR PROTRUSIONS, EITHER OF WHICH SHALL NOT EXCEED 0.20 [0.008] PER SIDE.

8-PIN SOIC .150" WIDE (Z8-1)



Rev. 03

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