FEATURES

- **5V power supply options**
- **High bandwidth output transitions**
- **Internal 75KΩ pull-down resistors on inputs**
- **Functionally equivalent to SY10/100EL16V with variable output swing**
- **Improved output waveform characteristics**
- **ESD protection of 2000V**
- **Available in 8-pin (3mm) TSSOP**

DESCRIPTION

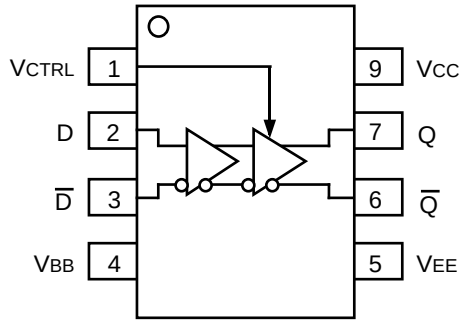
The SY100EL16S is a differential receiver with variable output swing. This device is functionally equivalent to the EL16V, with an additional input that control the output amplitude.

The operating range of the EL16S control input is from V_{BB} (max. swing) to V_{CC} (min. swing). Control of the output swing can be obtained by a variable resistor between the V_{BB} pin and V_{CC} with the wiper driving V_{CTRL}.

The EL16S provides a V_{BB} output for either single-ended use or as a DC bias for AC coupling to the device. The V_{BB} pin should be used only as a bias for the EL16S as its current sink/source capability is limited. Whenever used, the V_{BB} pin should be bypassed to V_{CC} via a 0.01µF capacitor.

Under open input conditions (pulled to V_{EE}), internal input clamps will force the Q output LOW.

PIN CONFIGURATION/BLOCK DIAGRAM



TOP VIEW

PIN NAMES

Pin	Function
D, $\overline{D}$	Data Inputs
Q, $\overline{Q}$	Data Outputs
V_{BB}	Reference Voltage Output
V_{CTRL}	Output Swing Control

TYPICAL VOLTAGE OUTPUT SWING

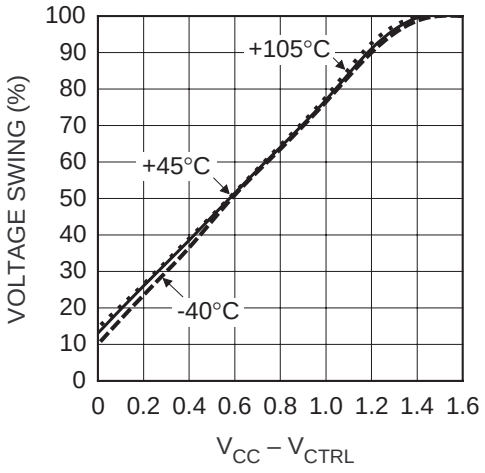


Figure 1. Typical Voltage Output Swing
Vcc = 5V

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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	—	—	22	—	—	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 –D, $\overline{D}$	—	—	150	—	—	150	—	—	150	—	—	150	µA
	Current –V_{CTRL}	—	—	40	—	—	40	—	—	40	—	—	40	

NOTE:

1. Parametric values specified at: 100EL16S Series: –4.5V to –5.5V.

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 D (Diff)	175	—	325	175	—	325	175	—	325	205	—	355	ps
t_{PHL}	Delay to Output D (SE)	125	250	425	125	250	375	125	250	375	125	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
V_{OL}	Output LOW Voltage[5] V_{CTRL} = V_{BB}	-1890	—	-1620	-1870	—	-1680	-1870	-1775	-1680	-1870	—	-1680	mV
V_{OL}	Output LOW Voltage[5] V_{CTRL} = V_{CC}	-1180	—	-975	-1135	—	-990	-1135	-1065	-990	-1135	—	-990	mV
V_{OH}	Output HIGH Voltage[6]	-1085	—	-880	-1025	—	-880	-1025	-955	-880	-1025	—	-880	mV
tr tf	Output Rise/Fall Times Q (20% to 80%)	—	—	350	—	—	350	—	—	350	—	—	350	ps

NOTES:

1. Parametric values specified at: 100EL16S Series: –4.5V to –5.5V.
2. Duty cycle skew is the difference between a t_{PLH} and t_{PHL} propagation delay through a device.
3. Minimum input swing for which AC parameters are guaranteed. The device has a DC gain of ≈40 when output has a full swing.
4. 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)|.
5. If V_{CTRL} is Open Circuit, use the V_{OH} (max. & min.) and V_{OL} (V_{CTRL} = V_{BB}: max only) limits.
6. $V_{CC} \geq V_{CTRL} \geq V_{EE}$

PRODUCT ORDERING CODE

Ordering Code	Package Type	Operating Range	V_{EE} Range (V)
SY100EL16SKC	K8-1	Commercial	–4.5 to –5.5
SY100EL16SZC	Z8-1	Commercial	–4.5 to –5.5

APPLICATION IMPLEMENTATION

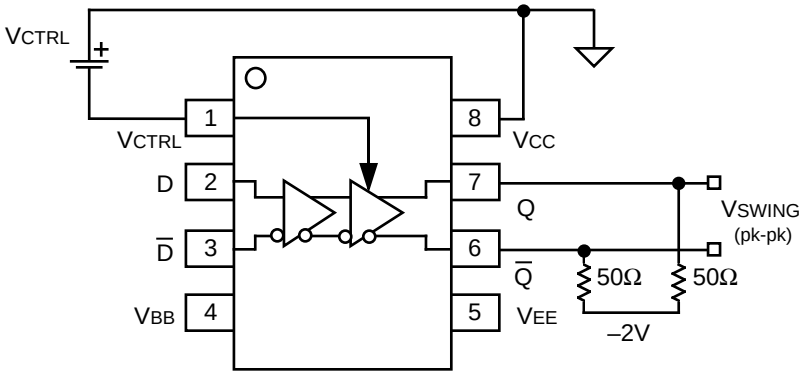


Figure 2. Voltage Source Implementation

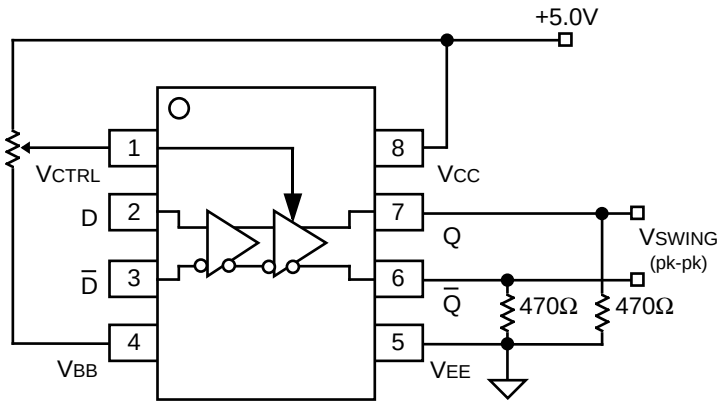
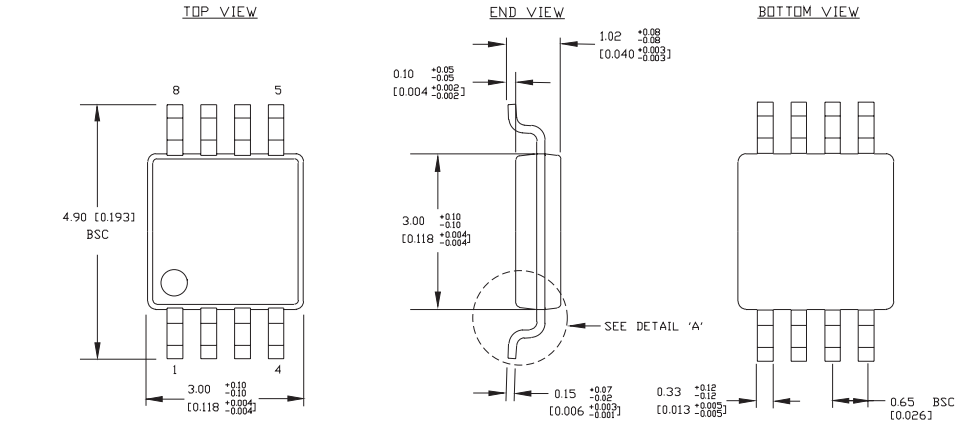
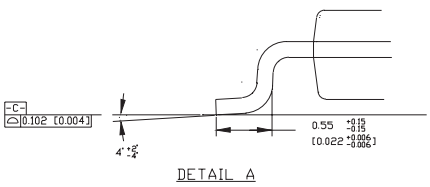


Figure 3. Alternative Implementation

8 LEAD TSSOP (K8-1)





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

8 LEAD PLASTIC SOIC (Z8-1)

