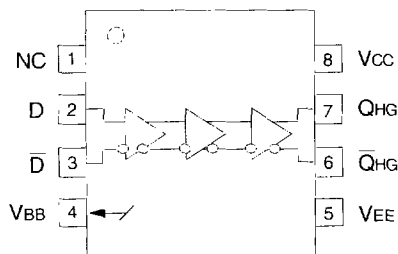


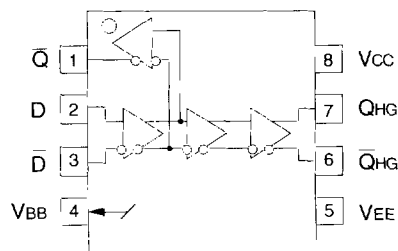
FEATURES

- 3.3V and 5V power supply options
- 250ps propagation delay
- Very high voltage gain vs. standard EL16
- Ideal for Pulse Amplifier and Limiting Amplifier applications
- Data synchronous Enable/Disable ($\overline{EN}$) on QHG and $\overline{QHG}$ provides for complete glitchless gating of the outputs
- Ideal for gating timing signals
- Complete solution for high quality, high frequency crystal oscillator applications
- Internal 75K Ohm input pull-down resistors
- ESD protection of 2000V
- Available in both 8-pin SOIC and in DIE form

PIN CONFIGURATION/BLOCK DIAGRAM



SY10/100EL16A/LA
5V/3.3V Differential Receiver w/High Gain



SY10/100EL16B/LB
EL16A/LA w/Extra QB output

DESCRIPTION

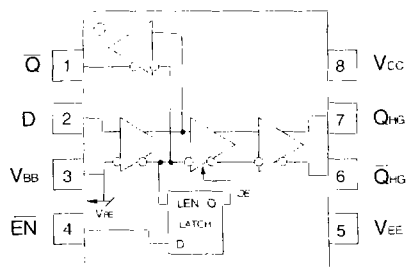
The SY10/100EL16A/LA/B/LB/C/LC/V are differential receivers. The devices are equivalent to SY10/100EL16 with enhanced capabilities. The QHG/QHG outputs have a DC gain several times larger than the DC gain of the Q output.

The SY10/100EL16A/LA have an identical pinout to the SY10/100EL16. It provides a VBB output for either single-ended application or as a DC bias for AC coupling to the device.

The SY10/100EL16B/LB are very similar to the SY10/100EL16A/LA. The Q output is provided for feedback purposes.

The SY10/100EL16C/LC provides an $\overline{EN}$ input which is synchronized with the data input (D) signal in a way that provides glitchless gating of the QHG and $\overline{QHG}$ outputs. When the $\overline{EN}$ signal is LOW, the input is passed to the outputs and the data output equals the data input. When the data input is HIGH and the $\overline{EN}$ goes HIGH, it will force the QHG LOW and the $\overline{QHG}$ HIGH on the next negative transition of the data input. If the data input is LOW when the $\overline{EN}$ goes HIGH, the next data transition to a HIGH is ignored and QHG remains LOW and $\overline{QHG}$ remains HIGH. The next positive transition of the data input is not passed on to the data outputs under these conditions. The QHG and $\overline{QHG}$ outputs remain in their disabled state as long as the $\overline{EN}$ input is held HIGH. The $\overline{EN}$ input has no influence on the Q output and the data input is passed on (inverted) to this output whether $\overline{EN}$ is HIGH or LOW. This configuration is ideal for crystal oscillator applications, where the oscillator can be free running and gated on and off synchronously without adding extra counts to the output.

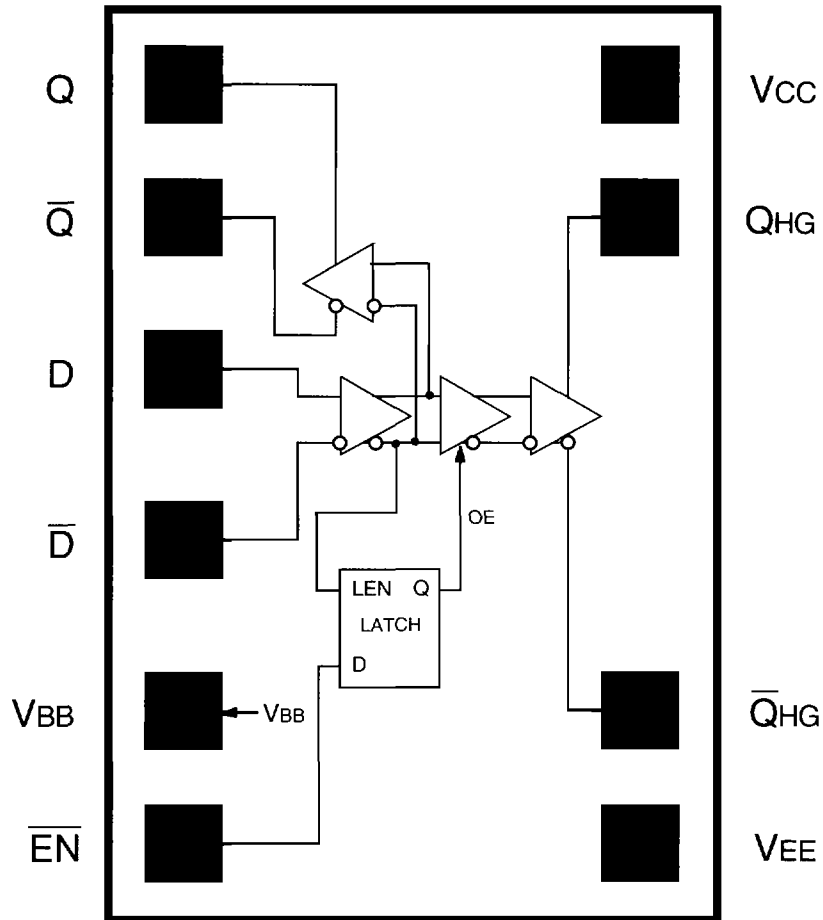
The SY10/100EL16V (DIE form) provides the flexibility of all the above combinations, as well as separate bond pad availability for additional Q, $\overline{Q}$, VBB and EN functions.



SY10/100EL16C/LC
EL16B/LB w/Enable input

DIE LAYOUT

All options in DIE form w/Extra Q output and VBB output
Die Size (mils) 39. X 52. X 14.5



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SY10/100EL16V

DIE
TOP VIEW

PIN NAMES

Pin	Function
D	Data Inputs
Q	Data Outputs
QHG	Data Outputs w/ High Gain
V _{BB}	Reference Voltage Output
$\overline{\text{EN}}$	Enable Input

TRUTH TABLE

$\overline{\text{EN}}$	QHG Output
0	Data
1	Logic Low

DC ELECTRICAL CHARACTERISTICS⁽¹⁾

V_{EE} = V_{EE} (Min) to V_{EE} (Max). V_{CC} = GND

Symbol	Parameter	-40°C			0°C			+25°C			+85°C			Unit
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
IEE	Power Supply Current	—	—	40	—	—	40	—	—	40	—	—	40	mA
	10EL 100EL	—	—	40	—	—	40	—	—	40	—	—	46	
VBB	Output Reference Voltage	-1.43	—	-1.30	-1.38	—	-1.27	-1.35	—	-1.25	-1.31	—	-1.19	V
	10EL 100EL	-1.38	—	-1.26	-1.38	—	-1.26	-1.38	—	-1.26	-1.38	—	-1.26	
I _{IH}	Input HIGH Current	—	—	150	—	—	150	—	—	150	—	—	150	μA

NOTE:

- Parametric values specified at: 5 volt Power Supply Range: 100EL16A/B/C/V Series: -4.2V to -5.5V.
10EL16A/B/C/V Series: -4.75V to -5.5V.
3 volt Power Supply Range: 10/100EL16LA/LB/LC/V Series: -3.0V to -3.8V.

AC ELECTRICAL CHARACTERISTICS⁽⁴⁾

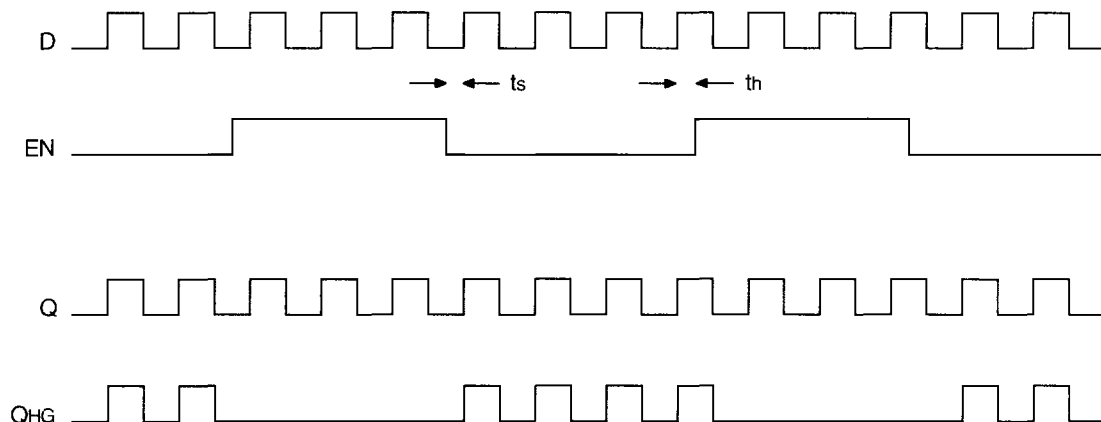
V_{EE} = V_{EE} (Min) to V_{EE} (Max). V_{CC} = GND

Symbol	Parameter	-40°C			0°C			+25°C			+85°C			Unit
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
tPLH	Propagation Delay to Q/Q Output	—	—	350	—	—	350	—	—	350	—	—	380	ps
tPHL	D (Diff)	—	—	400	—	—	400	—	—	400	—	—	430	
	D (SE)	—	—	400	—	—	400	—	—	400	—	—	430	
	QHG/QHG Output	—	—	650	—	—	650	—	—	650	—	—	730	
	D (Diff)	—	—	700	—	—	700	—	—	700	—	—	780	
	D (SE)	—	—	700	—	—	700	—	—	700	—	—	780	
tS	Setup Time	EN	—	150	—	—	150	—	—	150	—	—	150	ps
tH	Hold Time	EN	—	150	—	—	150	—	—	150	—	—	150	ps
tSkew	Duty Cycle Skew ⁽¹⁾													
	(Diff)	—	5	—	—	5	20	—	5	20	—	5	20	ps
VPP	Minimum Input Swing ⁽²⁾	150	—	—	150	—	—	150	—	—	150	—	—	mV
VCMR	Common Mode Range ⁽³⁾	-1.3	—	-0.4	-1.4	—	-0.4	-1.4	—	-0.4	-1.4	—	-0.4	V
tr	Output Q	100	225	350	100	225	350	100	225	350	100	225	350	ps
tf	Rise/Fall Time (20% TO 80%)	100	225	350	100	225	350	100	225	350	100	225	350	

NOTES:

- 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 to Q/Q outputs and a DC gain of ≈ 200 or higher to QHG/QHG outputs.
- 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)|.
- Parametric values specified at: 5 volt Power Supply Range: 100EL16A/B/C/V Series: -4.2V to -5.5V.
10EL16A/B/C/V Series: -4.75V to -5.5V.
3 volt Power Supply Range: 10/100EL16LA/LB/LC/V Series: -3.0V to -3.8V.

TIMING DIAGRAM



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PRODUCT ORDERING CODE

5V

Ordering Code	Package Type	Operating Range	VEE Range (V)
SY10EL16AZC	Z8-1	Commercial	-4.75 to -5.5
SY10EL16AZCTR	Z8-1	Commercial	-4.75 to -5.5
SY100EL16AZC	Z8-1	Commercial	-4.2 to -5.5
SY100EL16AZCTR	Z8-1	Commercial	-4.2 to -5.5
SY10EL16BZC	Z8-1	Commercial	-4.75 to -5.5
SY10EL16BZCTR	Z8-1	Commercial	-4.75 to -5.5
SY100EL16BZC	Z8-1	Commercial	-4.2 to -5.5
SY100EL16BZCTR	Z8-1	Commercial	-4.2 to -5.5
SY10EL16CZC	Z8-1	Commercial	-4.75 to -5.5
SY10EL16CZCTR	Z8-1	Commercial	-4.75 to -5.5
SY100EL16CZC	Z8-1	Commercial	-4.2 to -5.5
SY100EL16CZCTR	Z8-1	Commercial	-4.2 to -5.5

3.3V

Ordering Code	Package Type	Operating Range	VEE Range (V)
SY10EL16LAZC	Z8-1	Commercial	-3.0 to -3.8
SY10EL16LAZCTR	Z8-1	Commercial	-3.0 to -3.8
SY100EL16LAZC	Z8-1	Commercial	-3.0 to -3.8
SY100EL16LAZCTR	Z8-1	Commercial	-3.0 to -3.8
SY10EL16LBZC	Z8-1	Commercial	-3.0 to -3.8
SY10EL16LBZCTR	Z8-1	Commercial	-3.0 to -3.8
SY100EL16LBZC	Z8-1	Commercial	-3.0 to -3.8
SY100EL16LBZCTR	Z8-1	Commercial	-3.0 to -3.8
SY10EL16LCZC	Z8-1	Commercial	-3.0 to -3.8
SY10EL16LCZCTR	Z8-1	Commercial	-3.0 to -3.8
SY100EL16LCZC	Z8-1	Commercial	-3.0 to -3.8
SY100EL16LCZCTR	Z8-1	Commercial	-3.0 to -3.8
SY10EL16VXC	DIE	Commercial	-3.0 to -3.8
SY100EL16VXC	DIE	Commercial	-3.0 to -3.8