

**FEATURES**

- 3.3V and 5V power supply options
- Bandwidth  $-3\text{dB} > 2.5\text{GHz}$
- Internal  $75\text{k}\Omega$  input pulldown resistor
- Faster version of SY10EL16V
- 10K ECL compatible I/O
- Improved output waveform characteristics
- Available in 8-pin (3mm) MSOP and SOIC packages

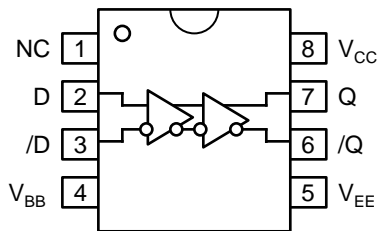
**DESCRIPTION**

The SY10EP16V is a high-speed differential receiver. The device is functionally equivalent to the EL16V devices, with higher performance capabilities. With output transition times significantly faster than the EL16V, the SY10EP16V is ideally suited for interfacing with high-frequency sources.

The SY10EP16V 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 SY10EP16V as its current sink/source capability is limited. Whenever used, the  $V_{BB}$  pin should be bypassed to ground via a  $0.01\mu\text{F}$  capacitor.

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

**PIN CONFIGURATION/BLOCK DIAGRAM**



Available in 8-Pin SOIC and MSOP Packages

**PIN NAMES**

Pin	Function
D, /D	ECL Data Inputs
Q, /Q	ECL Data Outputs
$V_{BB}$	Reference Voltage Output
$V_{CC}$	Positive Power Supply
$V_{EE}$	Negative Power Supply

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

Symbol	Rating	Value	Unit
V <sub>EE</sub>	Power Supply Voltage (V <sub>CC</sub> = 0)	-6.0 to 0	Vdc
V <sub>CC</sub>	Power Supply Voltage (V <sub>EE</sub> = 0)	+6.0 to 0	Vdc
V <sub>I</sub>	Input Voltage (V <sub>CC</sub> = 0V, V <sub>I</sub> not more negative than V <sub>EE</sub> ) Input Voltage (V <sub>EE</sub> = 0V, V <sub>I</sub> not more negative than V <sub>CC</sub> )	-6.0 to 0 +6.0 to 0	Vdc Vdc
I <sub>OUT</sub>	Output Current -Continuous -Surge	50 100	mA
I <sub>BB</sub>	V <sub>BB</sub> Sink/Source Current <sup>(2)</sup> ±0.5	mA	
T <sub>A</sub>	Operating Temperature Range	-40 to +85	°C
T <sub>store</sub>	Storage Temperature Range	-65 to +150	°C

**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.

**DC ELECTRICAL CHARACTERISTICS<sup>(1)</sup>**

V<sub>CC</sub> = 0V; V<sub>EE</sub> = -5.5V to -3.0V; V<sub>CC</sub> = 3.0V to 5.5V, V<sub>EE</sub> = 0V<sup>(5)</sup>

Symbol	Parameter	T <sub>A</sub> = -40°C		T <sub>A</sub> = +25°C			T <sub>A</sub> = +85°C		Unit
		Min.	Max.	Min.	Typ.	Max.	Min.	Max.	
I <sub>EE</sub>	Power Supply Current <sup>(2)</sup>	—	42	—	—	42	—	42	mA
V <sub>OH</sub>	Output HIGH Voltage <sup>(3)</sup>	V <sub>CC</sub> -1080	V <sub>CC</sub> -0890	V <sub>CC</sub> -0980	—	V <sub>CC</sub> -0810	V <sub>CC</sub> -0910	V <sub>CC</sub> -0720	mV
V <sub>OL</sub>	Output LOW Voltage <sup>(3)</sup>	V <sub>CC</sub> -1950	V <sub>CC</sub> -1650	V <sub>CC</sub> -1950	—	V <sub>CC</sub> -1630	V <sub>CC</sub> -1950	V <sub>CC</sub> -1595	mV
V <sub>IH</sub>	Input HIGH Voltage	V <sub>CC</sub> -1230	V <sub>CC</sub> -0890	V <sub>CC</sub> -1130	—	V <sub>CC</sub> -0810	V <sub>CC</sub> -1060	V <sub>CC</sub> -0720	mV
V <sub>IL</sub>	Input LOW Voltage	V <sub>CC</sub> -1950	V <sub>CC</sub> -1500	V <sub>CC</sub> -1950	—	V <sub>CC</sub> -1480	V <sub>CC</sub> -1950	V <sub>CC</sub> -1445	mV
V <sub>BB</sub>	Output Reference Voltage	V <sub>CC</sub> -1430	V <sub>CC</sub> -1300	V <sub>CC</sub> -1350	—	V <sub>CC</sub> -1250	V <sub>CC</sub> -1310	V <sub>CC</sub> -1190	mV
V <sub>IHCMR</sub>	Input HIGH Voltage Common Mode Range <sup>(4)</sup>	V <sub>EE</sub> +2.0	V <sub>CC</sub> -4.0	V <sub>EE</sub> +2.0	—	V <sub>CC</sub> -4.0	V <sub>EE</sub> +2.0	V <sub>CC</sub> -4.0	V
I <sub>IH</sub>	Input HIGH Current	—	150	—	—	150	—	150	µA
I <sub>IL</sub>	Input LOW Current	0.5	—	0.5	—	—	0.5	—	µA

**NOTES:**

1. 10EP circuits are designed to meet the DC specifications shown in the above table after thermal equilibrium has been established. The circuit is in a test socket or mounted on a printed circuit board and traverse airflow greater than 500lfpm is maintained.
2. V<sub>CC</sub> = 0V, V<sub>EE</sub> = V<sub>EE</sub>(Min.) to V<sub>EE</sub>(Max.), all other pins floating.
3. All loading with 50Ω to V<sub>CC</sub> - 2.0V.
4. V<sub>IHCMR</sub>(Min.) varies 1:1 with V<sub>EE</sub>, Max. varies 1:1 with V<sub>CC</sub>.
5. Input and output parameters vary 1:1 with V<sub>CC</sub>.

## AC ELECTRICAL CHARACTERISTICS

$V_{CC} = 0V$ ;  $V_{EE} = -5.5V$  to  $-3.0V$ ;  $V_{CC} = 3.0V$  to  $5.5V$ ,  $V_{EE} = 0V$

Symbol	Parameter	$T_A = -40^\circ C$		$T_A = +25^\circ C$			$T_A = +85^\circ C$		Unit
		Min.	Max.	Min.	Typ.	Max.	Min.	Max.	
$f_{MAX}$	Maximum Toggle Frequency <sup>(1)</sup>	—	—	—	3	—	—	—	GHz
$t_{PLH}$ $t_{PHL}$	Propagation Delay to Output Differential <sup>(2)</sup> D→Q, /Q	100	300	150	200	250	200	300	ps
$t_{SKEW}$	Device Skew	—	—	—	5.0	20	—	20	ps
$t_r$ $t_f$	Output Rise/Fall Times (20% to 80%) Q	60	180	60	110	180	70	180	ps

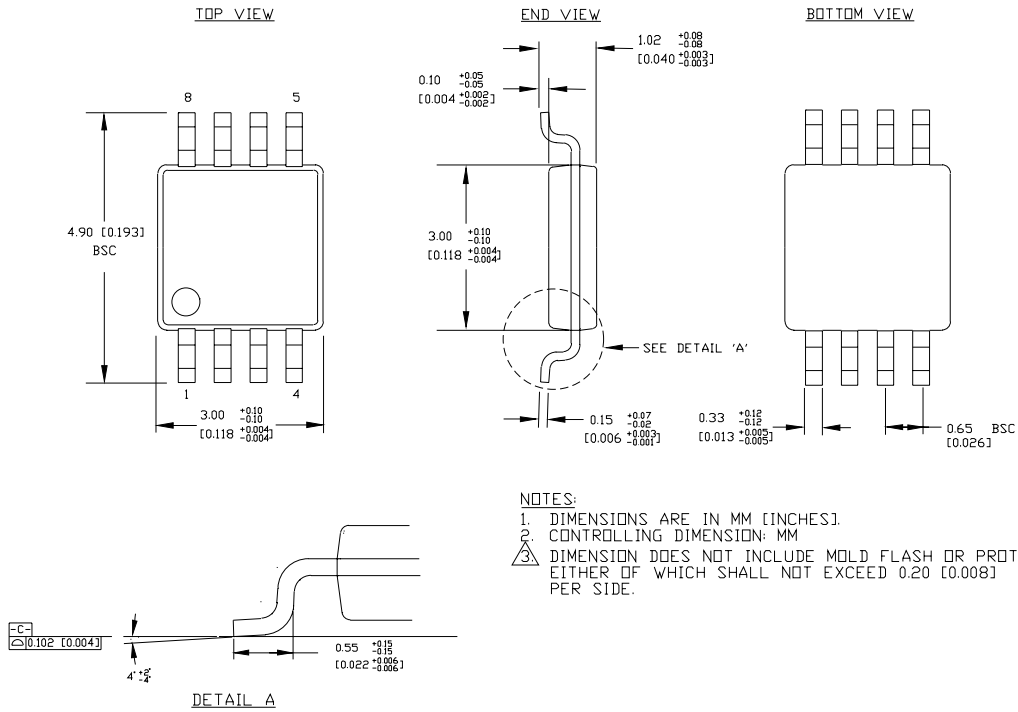
### NOTES:

- $f_{MAX}$  guaranteed for functionality only.  $V_{OL}$  and  $V_{OH}$  levels are guaranteed at DC only.
- $V_{IN} = 800mV$

## PRODUCT ORDERING INFORMATION

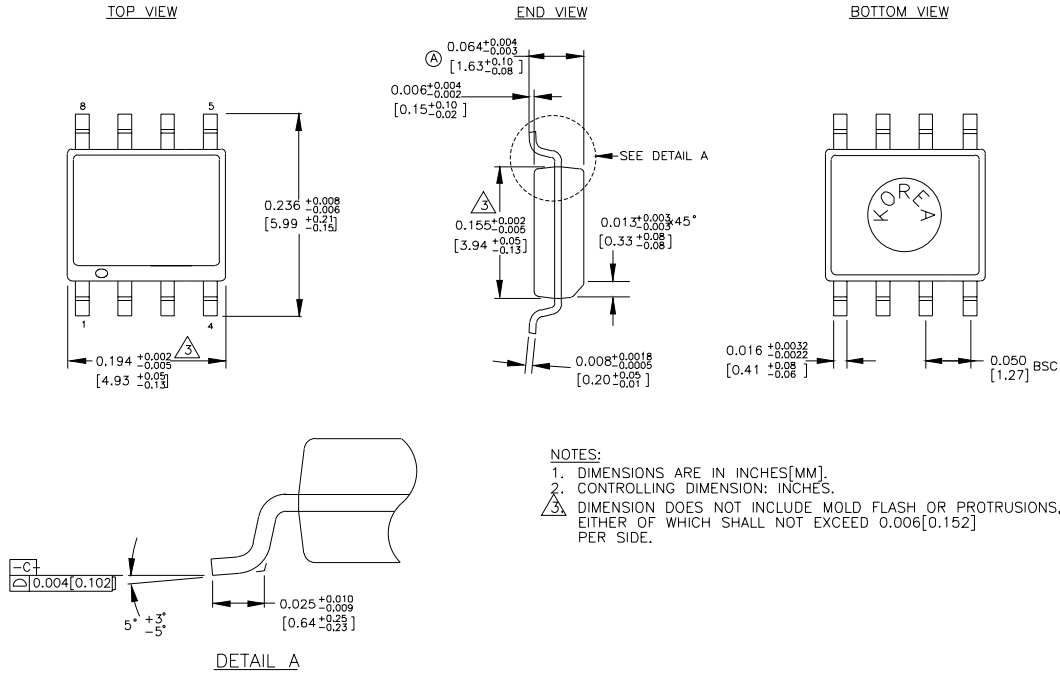
Ordering Code	Package Type	Operating Range	Package Marking
SY10EP16VZC	Z8-1	Commercial	HP16
SY10EP16VZCTR	Z8-1	Commercial	HP16
SY10EP16VKC	K8-1	Commercial	HEP16
SY10EP16VKCTR	K8-1	Commercial	HEP16

**8 LEAD MSOP (K8-1)**



Rev.01

**8 LEAD PLASTIC SOIC (Z8-1)**



Rev.03

**MICREL-SYNERGY 3250 SCOTT BOULEVARD SANTA CLARA CA 95054 USA**

TEL + 1 (408) 980-9191 FAX + 1 (408) 914-7878 WEB <http://www.synergyssemi.com> <http://www.micrel.com>

This information is believed to be accurate and reliable, however no responsibility is assumed by Micrel for its use nor for any infringement of patents or other rights of third parties resulting from its use. No license is granted by implication or otherwise under any patent or patent right of Micrel Inc.

© 2000 Micrel Incorporated