![MICREL - The Infinite Bandwidth Company™]

FEATURES

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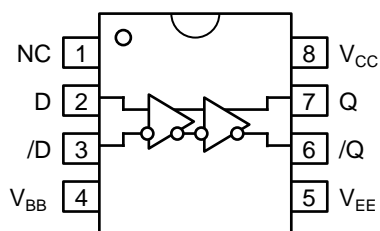- **Available in 8-pin (3mm) MSOP and SOIC packages**

ECL Pro™

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 0.01µF 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

1

ABSOLUTE MAXIMUM RATINGS[1]

Symbol	Rating	Value	Unit
V_{EE}	Power Supply Voltage (V_{CC} = 0)	−6.0 to 0	Vdc
V_{CC}	Power Supply Voltage (V_{EE} = 0)	+6.0 to 0	Vdc
V_{IN}	Input Voltage (V_{CC} = 0V, V_{IN} not more negative than V_{EE}) Input Voltage (V_{EE} = 0V, V_{IN} not more negative than V_{CC})	−6.0 to 0 +6.0 to 0	Vdc Vdc
I_{OUT}	Output Current −Continuous −Surge	50 100	mA
I_{BB}	V_{BB} Sink/Source Current[2]	±0.5	mA
T_A	Operating Temperature Range	−40 to +85	°C
T_{store}	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[1]

V_{CC} = 0V; V_{EE} = −5.5V to −3.0V; V_{CC} = 3.0V to 5.5V, V_{EE} = 0V[5]

Symbol	Parameter	T_A = −40°C		T_A = +25°C			T_A = +85°C		Unit
		Min.	Max.	Min.	Typ.	Max.	Min.	Max.	
I_{EE}	Power Supply Current[2]	—	42	—	—	42	—	42	mA
V_{OH}	Output HIGH Voltage[3]	V_{CC} −1080	V_{CC} −0890	V_{CC} −0980	—	V_{CC} −0810	V_{CC} −0910	V_{CC} −0720	mV
V_{OL}	Outpuut LOW Voltage[3]	V_{CC} −1950	V_{CC} −1650	V_{CC} −1950	—	V_{CC} −1630	V_{CC} −1950	V_{CC} −1595	mV
V_{IH}	Input HIGH Voltage	V_{CC} −1230	V_{CC} −0890	V_{CC} −1130	—	V_{CC} −0810	V_{CC} −1060	V_{CC} −0720	mV
V_{IL}	Input LOW Voltage	V_{CC} −1950	V_{CC} −1500	V_{CC} −1950	—	V_{CC} −1480	V_{CC} −1950	V_{CC} −1445	mV
V_{BB}	Output Reference Voltage	V_{CC} −1430	V_{CC} −1300	V_{CC} −1350	—	V_{CC} −1250	V_{CC} −1310	V_{CC} −1190	mV
V_{IHCMR}	Input HIGH Voltage Common Mode Range[4]	V_{EE} +2.0	V_{CC} −4.0	V_{EE} +2.0	—	V_{CC} −4.0	V_{EE} +2.0	V_{CC} −4.0	V
I_{IH}	Input HIGH Current	—	150	—	—	150	—	150	μA
I_{IL}	Input LOW Current	0.5	—	0.5	—	—	0.5	—	μA

Note 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.

Note 2. V_{CC} = 0V, V_{EE} = V_{EE}(min.) to V_{EE}(max.), all other pins floating.

Note 3. All loading with 50Ω to V_{CC} − 2.0V.

Note 4. V_{IHCMR}(min.) varies 1:1 with V_{EE}, Max. varies 1:1 with V_{CC}.

Note 5. Input and output parameters vary 1:1 with V_{CC}.

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		$T_A = -40°C$		$T_A = +25°C$			$T_A = +85°C$		Unit
			Min.	Max.	Min.	Typ.	Max.	Min.	Max.	
f_{MAX}	Maximum Toggle Frequency[1]		—	—	—	3	—	—	—	GHz
t_{PLH} t_{PHL}	Propagation Delay to Output Differential[2] $D \to Q, /Q$		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

Note 1. f_{MAX} guaranteed for functionality only. V_{OL} and V_{OH} levels are guaranteed at DC only.
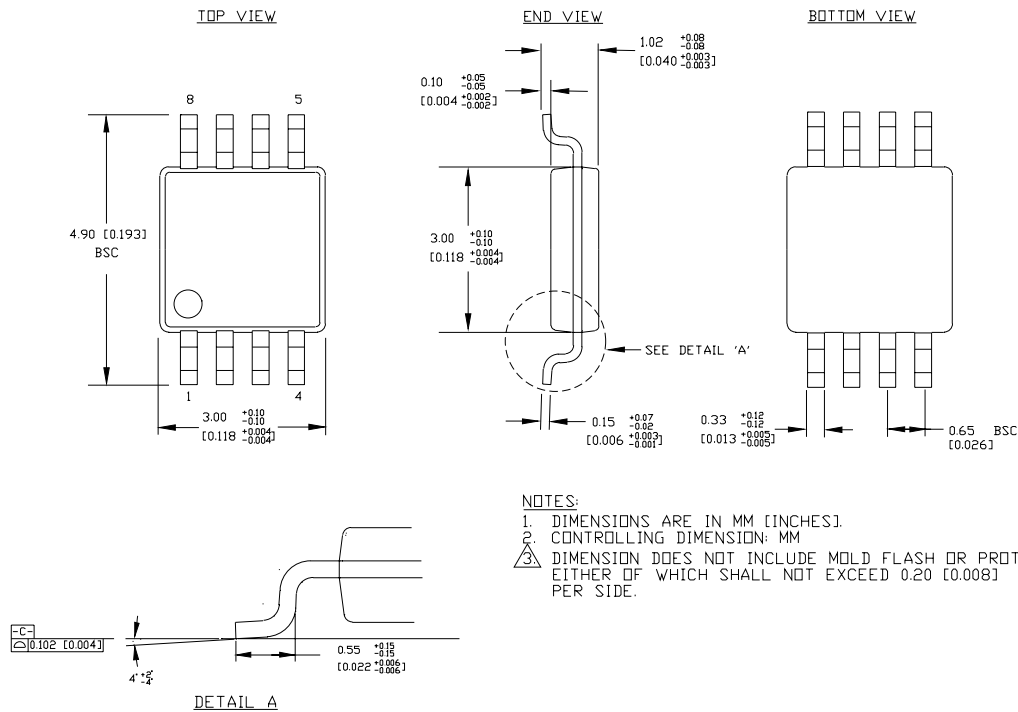
Note 2. $V_{IN} = 800mV$.

PRODUCT ORDERING CODE

Ordering Code	Package Type	Operating Range	Package Marking	Ordering Code	Package Type	Operating Range	Package Marking
SY10EP16VZC	Z8-1	Commercial	HP16	SY10EP16VZI[2]	Z8-1	Industrial	HP16
SY10EP16VZCTR[1]	Z8-1	Commercial	HP16	SY10EP16VZITR[1,2]	Z8-1	Industrial	HP16
SY10EP16VKC	K8-1	Commercial	HEP16	SY10EP16VKI[2]	K8-1	Industrial	HEP16
SY10EP16VKCTR[1]	K8-1	Commercial	HEP16	SY10EP16VKITR[1,2]	K8-1	Industrial	HEP16

Note 1. Tape and Reel.

Note 2. Recommended for new designs.

8 LEAD MSOP (K8-1)

TOP VIEW

8   5

4.90 [0.193]
BSC

1   4

3.00 $^{+0.10}_{-0.10}$
[0.118 $^{+0.004}_{-0.004}$]

END VIEW

1.02 $^{+0.08}_{-0.08}$
[0.040 $^{+0.003}_{-0.003}$]

0.10 $^{+0.05}_{-0.05}$
[0.004 $^{+0.002}_{-0.002}$]

3.00 $^{+0.10}_{-0.10}$
[0.118 $^{+0.0004}_{-0.0004}$]

SEE DETAIL 'A'

0.15 $^{+0.07}_{-0.02}$
[0.006 $^{+0.003}_{-0.001}$]

0.33 $^{+0.12}_{-0.12}$
[0.013 $^{+0.005}_{-0.005}$]

BOTTOM VIEW

0.65 BSC
[0.026]

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.

-C-
0.102 [0.004]

4° $^{+2°}_{-4°}$

0.55 $^{+0.15}_{-0.15}$
[0.022 $^{+0.006}_{-0.006}$]

DETAIL A

Rev. 01

8 LEAD PLASTIC SOIC (Z8-1)
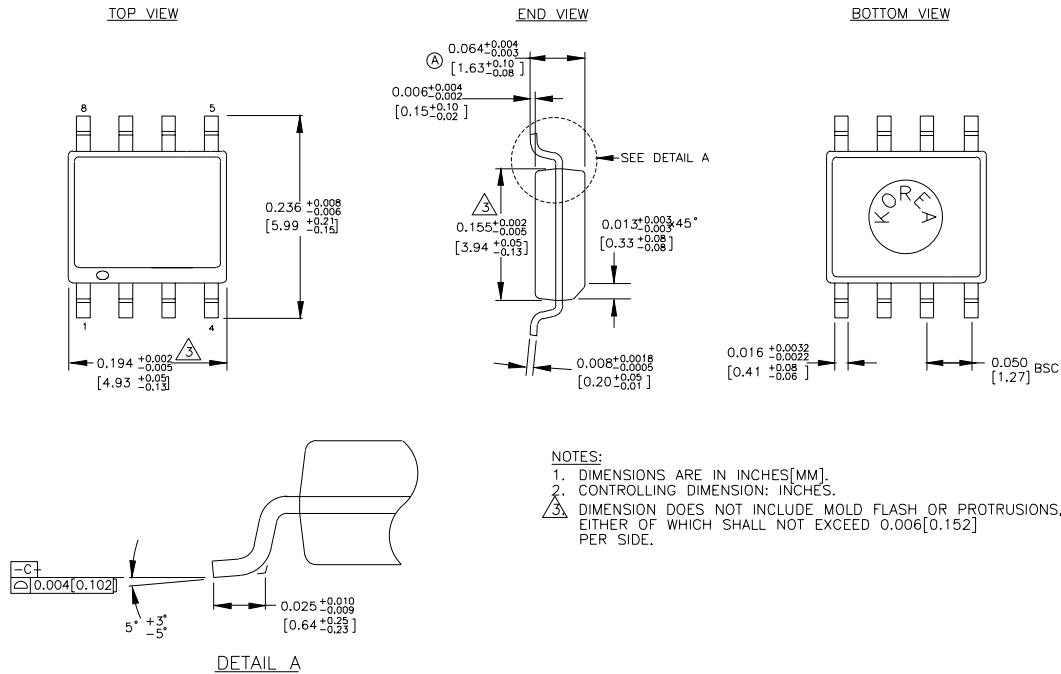
TOP VIEW

8

5

0.236 +0.008/−0.006
[5.99 +0.21/−0.15]

1

4

0.194 +0.002/−0.005
[4.93 +0.05/−0.13]

END VIEW

(A) 0.064 +0.004/−0.003
[1.63 +0.10/−0.08]

0.006 +0.004/−0.002
[0.15 +0.10/−0.02]

SEE DETAIL A

0.155 +0.002/−0.005
[3.94 +0.05/−0.13]

0.013 +0.003/−0.003 45°
[0.33 +0.08/−0.08]

0.008 +0.0018/−0.0005
[0.20 +0.05/−0.01]

BOTTOM VIEW

KOREA

0.016 +0.0032/−0.0022
[0.41 +0.08/−0.06]

0.050 BSC
[1.27]

NOTES:
1. DIMENSIONS ARE IN INCHES[MM].
2. CONTROLLING DIMENSION: INCHES.
3. DIMENSION DOES NOT INCLUDE MOLD FLASH OR PROTRUSIONS, EITHER OF WHICH SHALL NOT EXCEED 0.006[0.152] PER SIDE.

−C−
0.004[0.102]

5° +3°/−5°

0.025 +0.010/−0.009
[0.64 +0.25/−0.23]

DETAIL A

Rev. 03

The information furnished by Micrel in this datasheet is believed to be accurate and reliable. However, no responsibility is assumed by Micrel for its use. Micrel reserves the right to change circuitry and specifications at any time without notification to the customer.