

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



ECL Pro™

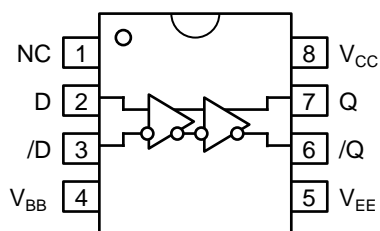
DESCRIPTION

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 $0.01\mu\text{F}$ 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⁽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	$T_A = -40^{\circ}C$		$T_A = +25^{\circ}C$			$T_A = +85^{\circ}C$		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}	Output 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. $V_{CC} = 0V$, $V_{EE} = V_{EE}(\text{min.})$ to $V_{EE}(\text{max.})$, all other pins floating.

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

Note 4. $V_{IHCMR}(\text{min.})$ 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	$T_A = -40^\circ C$		$T_A = +25^\circ C$			$T_A = +85^\circ C$		Unit
		Min.	Max.	Min.	Typ.	Max.	Min.	Max.	
f_{MAX}	Maximum Toggle Frequency ⁽¹⁾	—	—	—	3	—	—	—	GHz
t_{PLH} t_{PHL}	Propagation Delay to Output Differential ⁽²⁾ 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

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

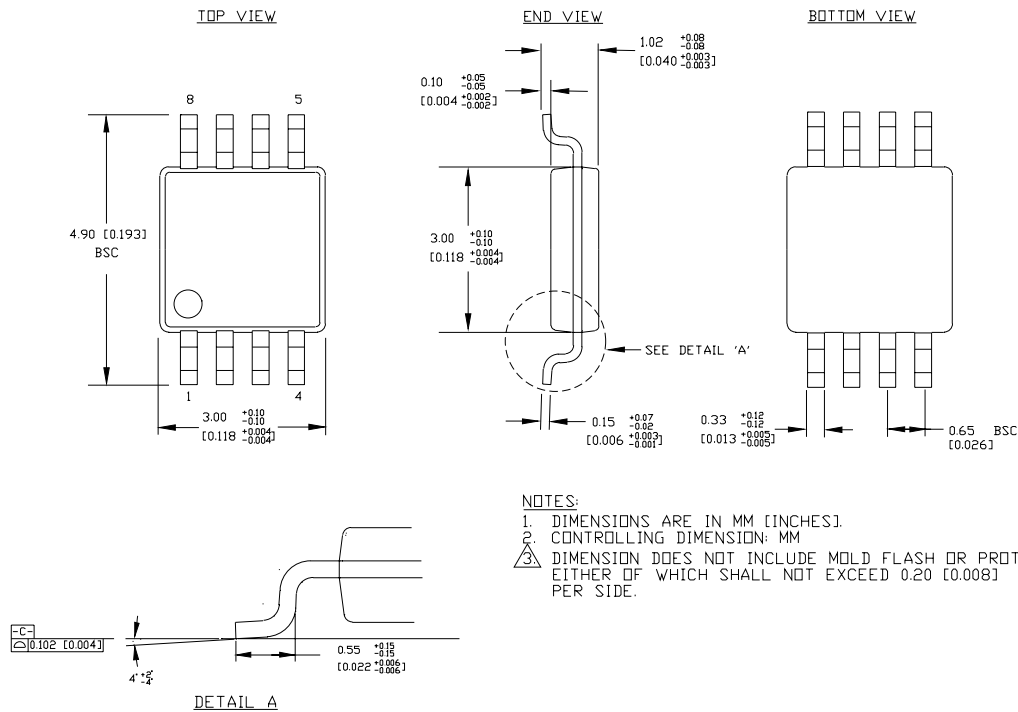
Ordering Code	Package Type	Operating Range	Package Marking
SY10EP16VZC	Z8-1	Commercial	HP16
SY10EP16VZCTR ⁽¹⁾	Z8-1	Commercial	HP16
SY10EP16VKC	K8-1	Commercial	HEP16
SY10EP16VKCTR ⁽¹⁾	K8-1	Commercial	HEP16

Ordering Code	Package Type	Operating Range	Package Marking
SY10EP16VZI ⁽²⁾	Z8-1	Industrial	HP16
SY10EP16VZITR ^(1,2)	Z8-1	Industrial	HP16
SY10EP16VKI ⁽²⁾	K8-1	Industrial	HEP16
SY10EP16VKITR ^(1,2)	K8-1	Industrial	HEP16

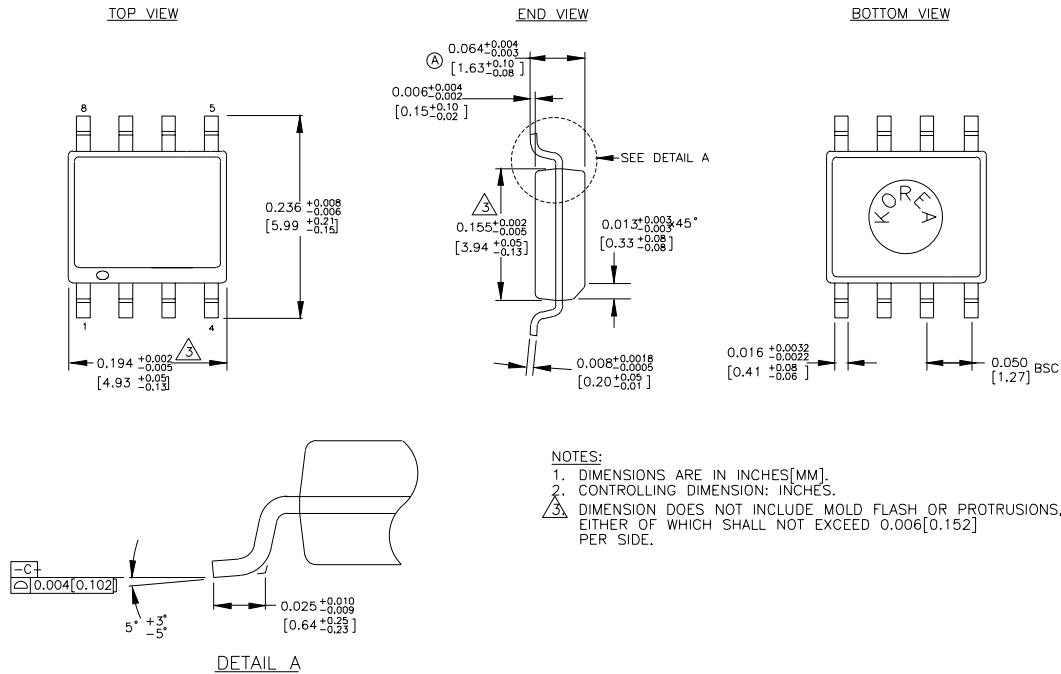
Note 1. Tape and Reel.

Note 2. Recommended for new designs.

8 LEAD MSOP (K8-1)



Rev. 01

8 LEAD PLASTIC SOIC (Z8-1)

Rev. 03

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