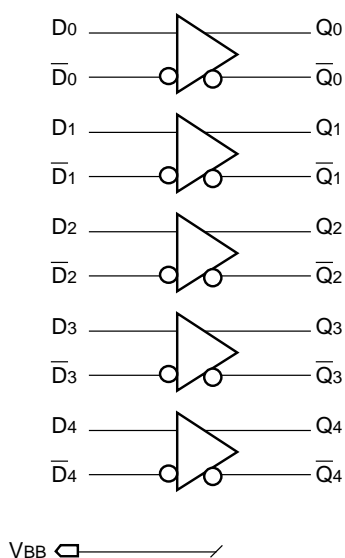


## FEATURES

- 450ps max. Propagation Delay
- Extended 100E VEE range of -4.2V to -5.5V
- VBB output for single-ended reception
- Fully compatible with industry standard 10KH, 100K I/O levels
- Internal 75K $\Omega$  input pulldown resistors
- Fully compatible with Motorola MC10E/100E116
- Available in 28-pin PLCC package

## BLOCK DIAGRAM



## DESCRIPTION

The SY10/100E116 are quint differential line receivers designed for use in new, high-performance ECL systems. These devices have emitter-follower outputs and an internally generated reference supply (VBB) for single-ended reception.

Active current sources combined with Micrel's ASSET™ technology provide the receivers with excellent common mode noise rejection.

The receiver design features clamp circuitry to cause a defined output state if both the inverting and non-inverting inputs are left open; in this case the Q output goes LOW, while the  $\bar{Q}$  output goes HIGH.

If both inverting and non-inverting inputs are at equal potential, the receiver does *not* go to a defined state, but rather shares current in normal differential amplifier fashion, producing output voltage levels midway between HIGH and LOW.

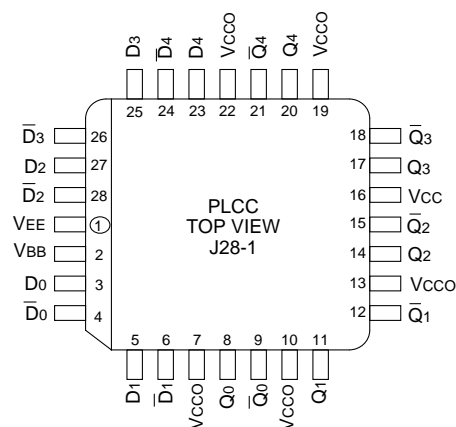
The VBB output is intended for use as a reference voltage for single-ended reception of ECL signals to that device only. When using VBB for this purpose, it is recommended that VBB is decoupled to VCC via a 0.01  $\mu$ F capacitor.

For higher bandwidth, please refer to the SY10/100E416 device.

## PIN NAMES

Pin	Function
D0, $\bar{D}_0$ -D4, $\bar{D}_4$	Differential Input Pairs
Q0, $\bar{Q}_0$ -Q4, $\bar{Q}_4$	Differential Output Pairs
VBB	Reference Voltage Output
VCCO	Vcc to Output

## PACKAGE/ORDERING INFORMATION



28-Pin PLCC (J28-1)

Ordering Information<sup>(1)</sup>

Part Number	Package Type	Operating Range	Package Marking	Lead Finish
SY10E116JI	J28-1	Industrial	SY10E116JI	Sn-Pb
SY10E116JITR <sup>(2)</sup>	J28-1	Industrial	SY10E116JI	Sn-Pb
SY100E116JI	J28-1	Industrial	SY100E116JI	Sn-Pb
SY100E116JITR <sup>(2)</sup>	J28-1	Industrial	SY100E116JI	Sn-Pb
SY10E116JC	J28-1	Commercial	SY10E116JC	Sn-Pb
SY10E116JCTR <sup>(2)</sup>	J28-1	Commercial	SY10E116JC	Sn-Pb
SY100E116JC	J28-1	Commercial	SY100E116JC	Sn-Pb
SY100E116JCTR <sup>(2)</sup>	J28-1	Commercial	SY100E116JC	Sn-Pb
SY10E116JY <sup>(3)</sup>	J28-1	Industrial	SY10E116JY with Pb-Free bar-line indicator	Matte-Sn
SY10E116JYTR <sup>(2, 3)</sup>	J28-1	Industrial	SY10E116JY with Pb-Free bar-line indicator	Matte-Sn
SY100E116JY <sup>(3)</sup>	J28-1	Industrial	SY100E116JY with Pb-Free bar-line indicator	Matte-Sn
SY100E116JYTR <sup>(2, 3)</sup>	J28-1	Industrial	SY100E116JY with Pb-Free bar-line indicator	Matte-Sn

## Notes:

1. Contact factory for die availability. Dice are guaranteed at  $T_A = 25^\circ\text{C}$ , DC Electricals only.
2. Tape and Reel.
3. Pb-Free package is recommended for new designs.

**LOGIC EQUATION**

$$Q_n = D_n$$

**DC ELECTRICAL CHARACTERISTICS**

$V_{EE} = V_{EE}(\text{Min.})$  to  $V_{EE}(\text{Max.})$ ;  $V_{CC} = V_{CCO} = \text{GND}$

Symbol	Parameter	$T_A = -40^\circ\text{C}$			$T_A = 0^\circ\text{C}$			$T_A = +25^\circ\text{C}$			$T_A = +85^\circ\text{C}$			Unit
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
$V_{BB}$	Output Reference Voltage	10E 100E	—	—	—	—	—	—	—	—	—	—	—	V
		—	—	—	—	—	—	—	—	—	—	—	—	
$I_{IH}$	Input HIGH Current	—	—	200	—	—	200	—	—	200	—	—	200	$\mu\text{A}$
$I_{EE}$	Power Supply Current	10E 100E	29	35	29	35	35	29	35	35	29	33	40	mA
		—	29	35	—	29	35	—	29	35	—	33	40	
$V_{PP}(\text{DC})$	Input Sensitivity <sup>(1)</sup>	150	—	—	150	—	—	150	—	—	150	—	—	mV
$V_{CMR}$	Common Mode Range <sup>(2)</sup>	—2.0	—	—0.6	—2.0	—	—0.6	—2.0	—	—0.6	—2.0	—	—0.6	V

**Notes:**

- $V_{PP}$  is the minimum differential input voltage required to assure full ECL levels are present at the outputs.
- $V_{CMR}$  is referenced to the most positive side of the differential input signal. Normal operation is obtained when the "HIGH" input is within the  $V_{CMR}$  range and the input swing is greater than  $V_{PP}(\text{min.})$  and  $<1\text{V}$ .

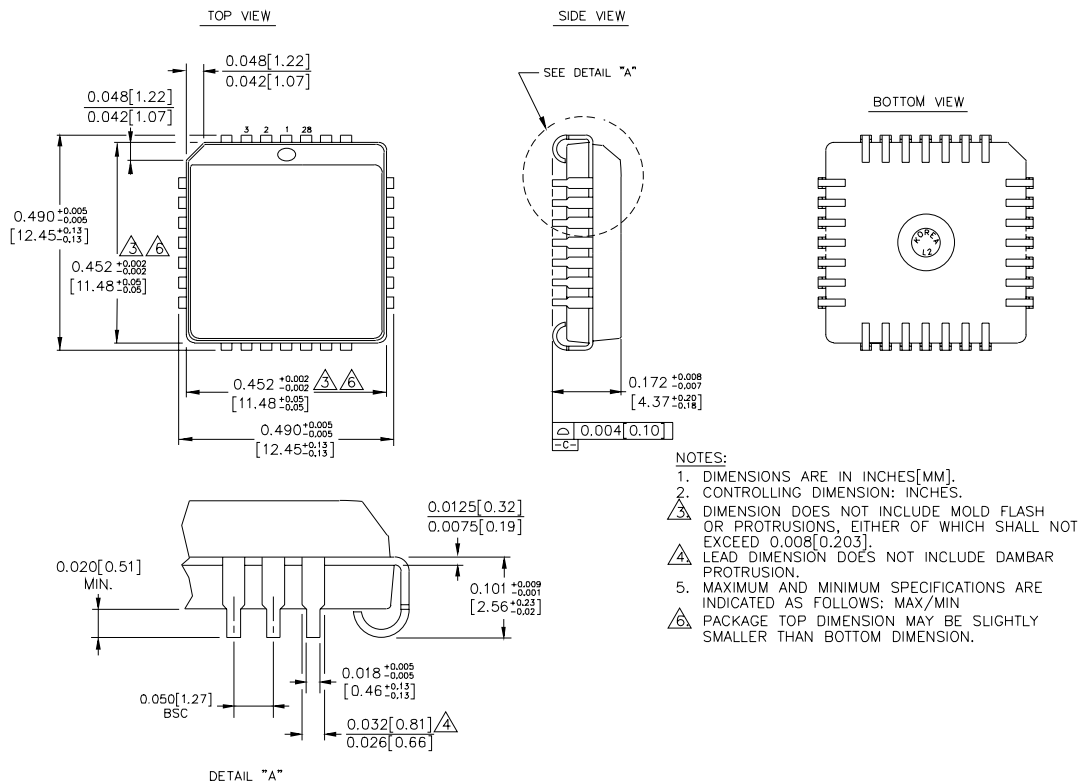
**AC ELECTRICAL CHARACTERISTICS**

$V_{EE} = V_{EE}(\text{Min.})$  to  $V_{EE}(\text{Max.})$ ;  $V_{CC} = V_{CCO} = \text{GND}$

Symbol	Parameter	$T_A = -40^\circ\text{C}$			$T_A = 0^\circ\text{C}$			$T_A = +25^\circ\text{C}$			$T_A = +85^\circ\text{C}$			Unit
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
$t_{PD}$	Propagation Delay to Output	150	300	500	200	300	450	200	300	450	200	300	450	ps
	D (S.E.)	150	300	550	150	300	500	150	300	500	150	300	500	
$V_{PP}(\text{DC})$	Input Sensitivity <sup>(1)</sup>	150	—	150	150	—	—	150	—	—	150	—	—	mV
$t_{skew}$	Within-Device Skew <sup>(2)</sup> Dn to Qn, $\bar{Q}_n$	—	50	—	—	50	—	—	50	—	—	50	—	ps
$t_{skew}$	Duty Cycle Skew <sup>(3)</sup> $t_{PLH} - t_{PHL}$	—	$\pm 10$	—	—	$\pm 10$	—	—	$\pm 10$	—	—	$\pm 10$	—	ps
$t_r$ $t_f$	Rise/Fall Time 20% to 80%	250	375	625	275	375	575	275	375	575	275	375	575	ps

**Notes:**

- Minimum input swing for which AC parameters are guaranteed.
- Within-device skew is defined as identical transitions on similar paths through a device.
- Duty cycle skew is defined only for differential operation when the delays are measured from the cross point of the inputs to the cross point of the outputs.

**28-PIN PLCC (J28-1)**

Rev. 03

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