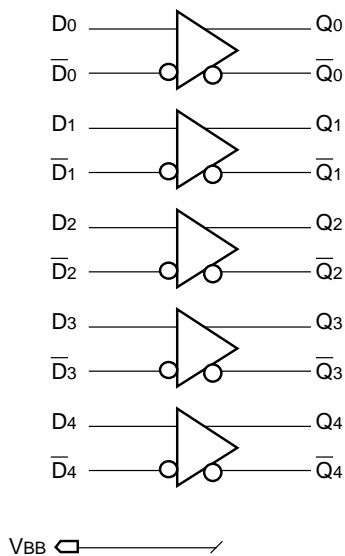


## FEATURES

- 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 75KΩ 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-Synergy's ASSET™ technology provide the receivers with excellent common mode noise rejection.

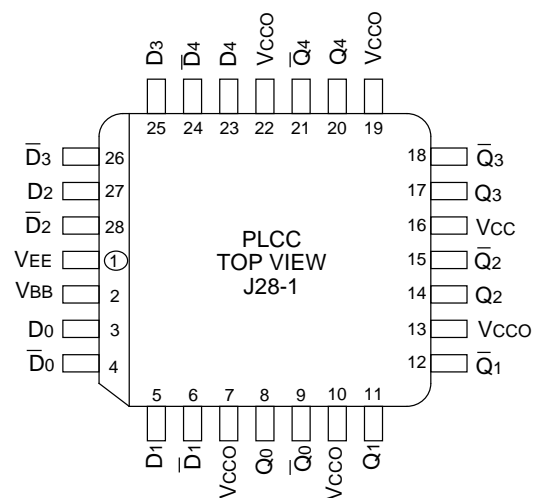
The receiver design features clamp circuitry to cause a defined output state if both the inverting and non-inverting inputs are left open; in this case the Q output goes LOW, while the  $\bar{Q}$  output goes HIGH.

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 μF capacitor.

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

## PIN CONFIGURATION



## PIN NAMES

Pin	Function
D <sub>0</sub> , $\bar{D}_0$ -D <sub>4</sub> , $\bar{D}_4$	Differential Input Pairs
Q <sub>0</sub> , $\bar{Q}_0$ -Q <sub>4</sub> , $\bar{Q}_4$	Differential Output Pairs
VBB	Reference Voltage Output
VCCO	Vcc to Output

**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	-1.43	—	-1.30	-1.38	—	-1.27	-1.35	—	-1.25	-1.31	—	-1.19	V
		100E	-1.43	—	-1.26	-1.38	—	-1.26	-1.38	—	-1.26	-1.38	—	-1.26	
$I_{IH}$	Input HIGH Current	—	—	200	—	—	200	—	—	200	—	—	200	$\mu\text{A}$	
$I_{EE}$	Power Supply Current	10E	—	29	35	—	29	35	—	29	35	—	29	35	mA
		100E	—	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  $<1V$ .

**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.	
$t_{PLH}$	Propagation Delay to Output	150	300	500	200	300	450	200	300	450	200	300	450	ps
$t_{PHL}$		D	150	300	550	150	300	500	150	300	500	150	300	
$V_{PP}(\text{DC})$	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
$t_r$	Rise/Fall Time 20% to 80%	250	375	625	275	375	575	275	375	575	275	375	575	ps
$t_f$														

**NOTES:**

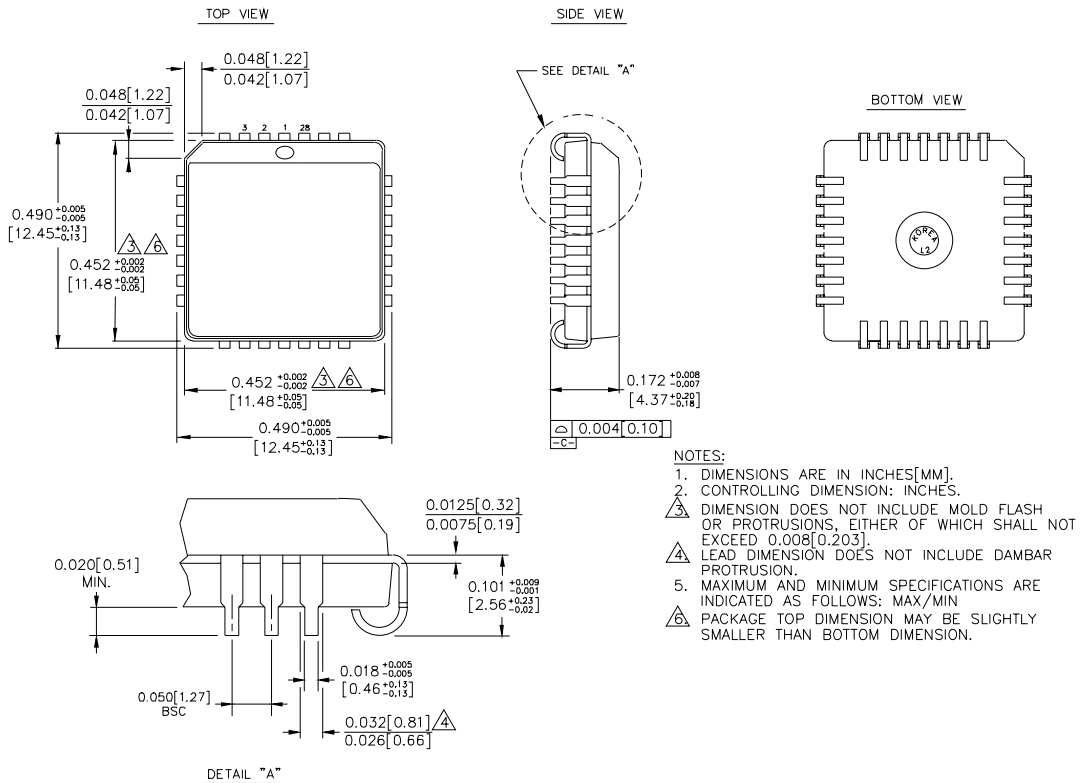
- Minimum input swing for which AC parameters are guaranteed.
- Within-device skew is defined as identical transitions on similar paths through a device.
- Duty cycle skew is defined only for differential operation when the delays are measured from the cross point of the inputs to the cross point of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

**PRODUCT ORDERING CODE**

Ordering Code	Package Type	Operating Range
SY10E116JC	J28-1	Commercial
SY10E116JCTR	J28-1	Commercial
SY100E116JC	J28-1	Commercial
SY100E116JCTR	J28-1	Commercial

Ordering Code	Package Type	Operating Range
SY10E116JI	J28-1	Industrial
SY10E116JITR	J28-1	Industrial
SY100E116JI	J28-1	Industrial
SY100E116JITR	J28-1	Industrial

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



- 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 0.008[0.203].
  4. LEAD DIMENSION DOES NOT INCLUDE DAMBAR PROTRUSION.
  5. MAXIMUM AND MINIMUM SPECIFICATIONS ARE INDICATED AS FOLLOWS: MAX/MIN
  6. PACKAGE TOP DIMENSION MAY BE SLIGHTLY SMALLER THAN BOTTOM DIMENSION.

Rev. 03

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

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

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