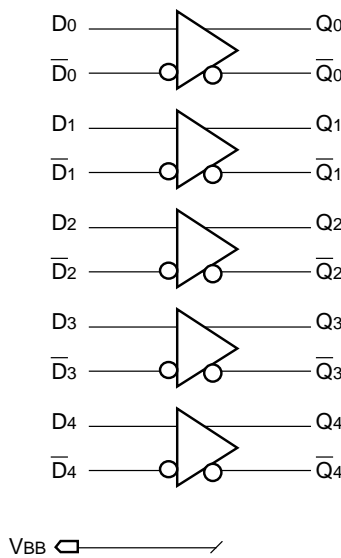


FEATURES

- 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.

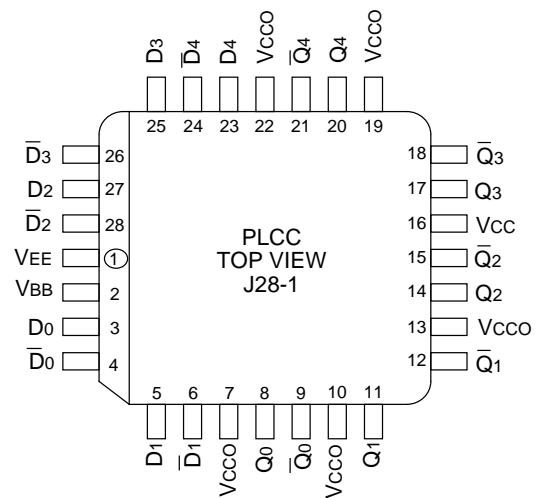
The receiver design features clamp circuitry to cause a defined output state if both the inverting and non-inverting inputs are left open; in this case the Q output goes LOW, while the \bar{Q} output goes HIGH.

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 |
|----------------------------------|---------------------------|
| 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 |

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 | μA | |
| 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 ⁽¹⁾ | 150 | — | — | 150 | — | — | 150 | — | — | 150 | — | — | mV | |
| V_{CMR} | Common Mode Range ⁽²⁾ | -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 ⁽¹⁾ | 150 | — | 150 | 150 | — | — | 150 | — | — | 150 | — | — | mV |
| t_{skew} | Within-Device Skew ⁽²⁾ Dn to Qn, \bar{Q}_n | — | 50 | — | — | 50 | — | — | 50 | — | — | 50 | — | ps |
| t_{skew} | Duty Cycle Skew ⁽³⁾ $t_{PLH} - t_{PHL}$ | — | ± 10 | — | — | ± 10 | — | — | ± 10 | — | — | ± 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:

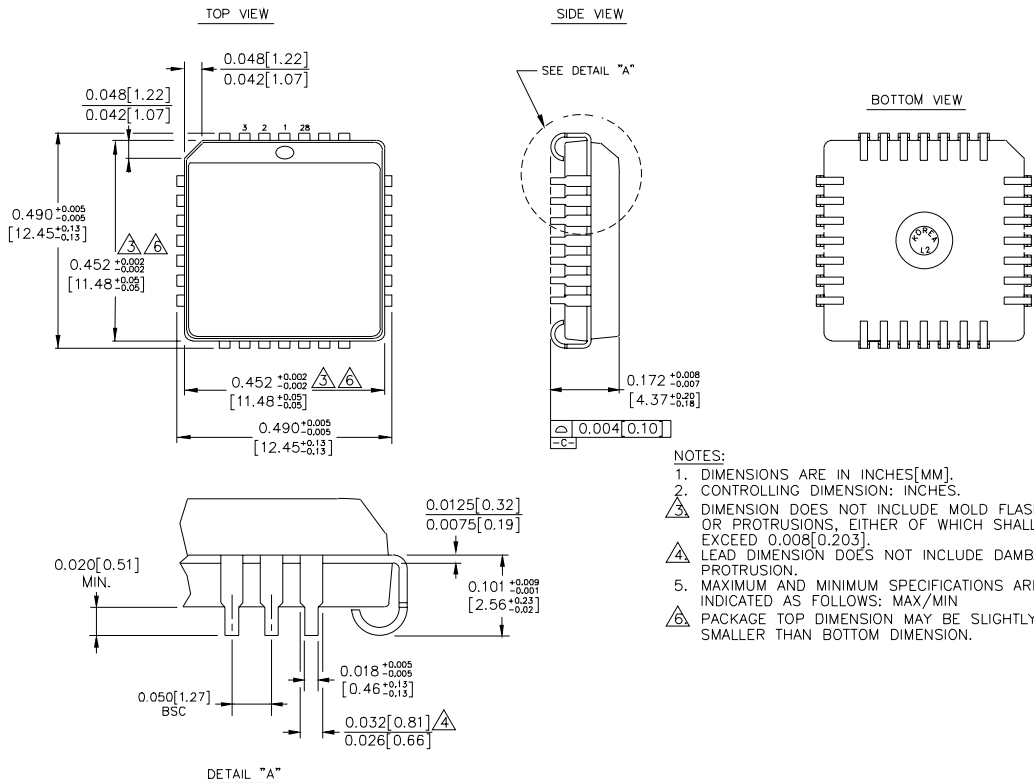
- Minimum input swing for which AC parameters are guaranteed.
- Within-device skew is defined as identical transitions on similar paths through a device.
- Duty cycle skew is defined only for differential operation when the delays are measured from the cross point of the inputs to the cross point of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

MICREL-SYNERGY 3250 SCOTT BOULEVARD SANTA CLARA CA 95054 USA

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