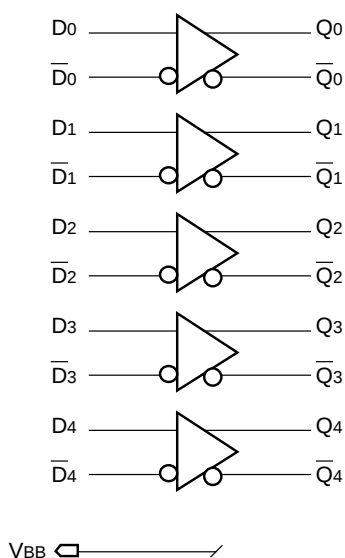


FEATURES

- 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.

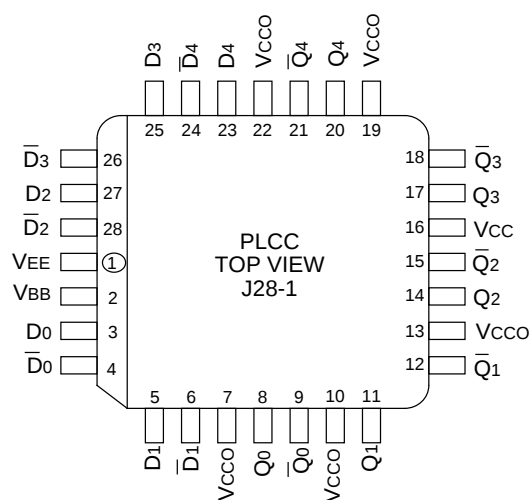
The receiver design features clamp circuitry to cause a defined output state if both the inverting and non-inverting inputs are left open; in this case the Q output goes LOW, while the $\bar{Q}$ output goes HIGH.

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 ₀ , $\bar{D}_0$ -D ₄ , $\bar{D}_4$	Differential Input Pairs
Q ₀ , $\bar{Q}_0$ -Q ₄ , $\bar{Q}_4$	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	—	—	—	—	—	—	—	—	—	—	—	V
		100E	—	—	—	—	—	—	—	—	—	—	—	
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 $<1\text{V}$.

AC ELECTRICAL CHARACTERISTICS

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

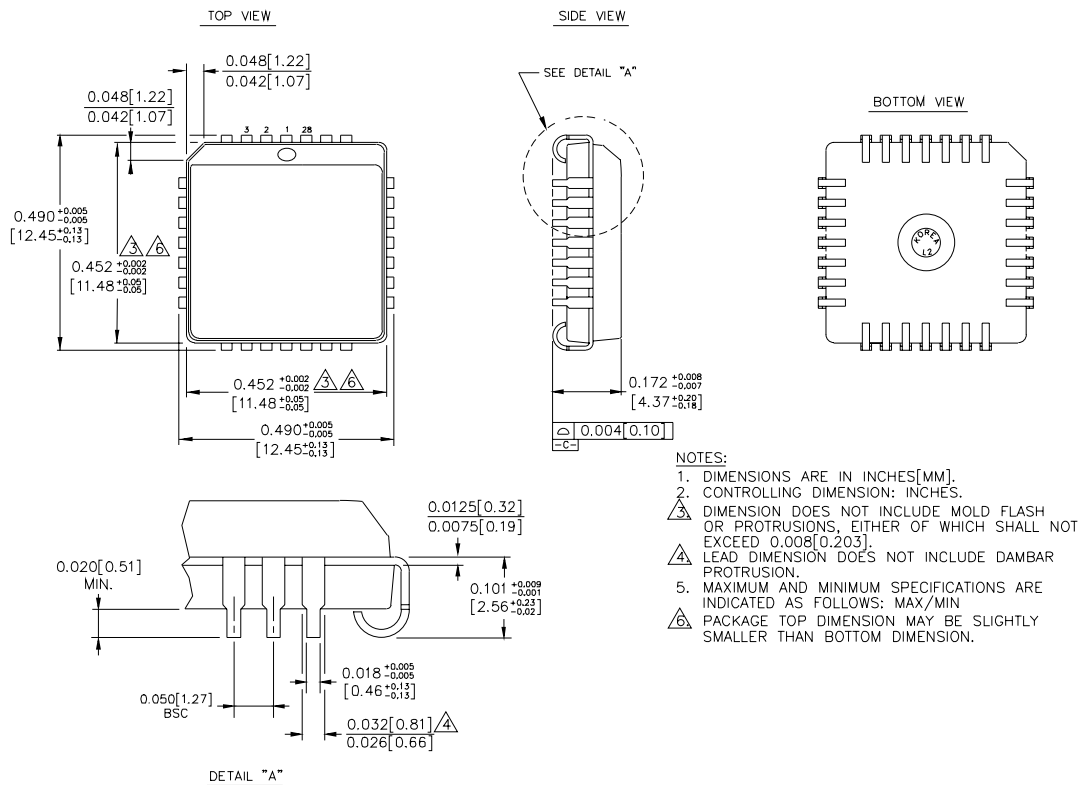
Symbol	Parameter	$T_A = -40^\circ\text{C}$			$T_A = 0^\circ\text{C}$			$T_A = +25^\circ\text{C}$			$T_A = +85^\circ\text{C}$			Unit
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
t_{PLH}	Propagation Delay to Output	150	300	500	200	300	450	200	300	450	200	300	450	ps
t_{PHL}		150	300	550	150	300	500	150	300	500	150	300	500	
$V_{PP}(\text{DC})$	Input Sensitivity ⁽¹⁾	150	—	150	150	—	—	150	—	—	150	—	—	mV
t_{skew}	Within-Device Skew ⁽²⁾ Dn to Qn, Qn	—	50	—	—	50	—	—	50	—	—	50	—	ps
t_{skew}	Duty Cycle Skew ⁽³⁾ $t_{PLH} - t_{PHL}$	—	± 10	—	—	± 10	—	—	± 10	—	—	± 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.

PRODUCT ORDERING CODE

Ordering Code	Package Type	Operating Range	Ordering Code	Package Type	Operating Range
SY10E116JC	J28-1	Commercial	SY10E116JI	J28-1	Industrial
SY10E116JCTR	J28-1	Commercial	SY10E116JITR	J28-1	Industrial
SY100E116JC	J28-1	Commercial	SY100E116JI	J28-1	Industrial
SY100E116JCTR	J28-1	Commercial	SY100E116JITR	J28-1	Industrial

28 LEAD PLCC (J28-1)

Rev. 03

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