



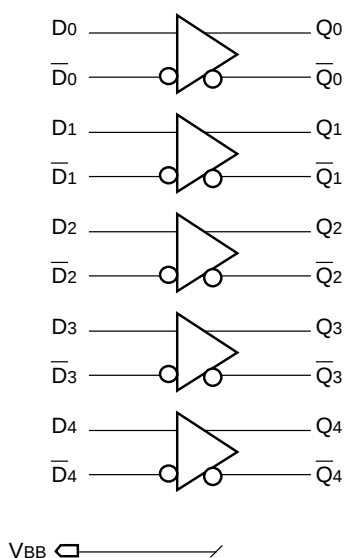
QUINT DIFFERENTIAL LINE RECEIVER

SY10E116
SY100E116

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 Ω 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.

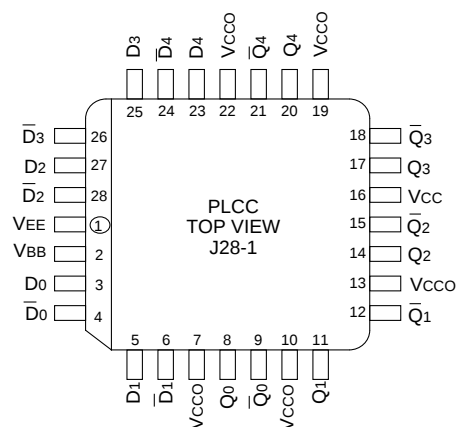
The VBB output is intended for use as a reference voltage for single-ended reception of ECL signals to that device only. When using VBB for this purpose, it is recommended that VBB is decoupled to Vcc via a 0.01 μ F capacitor.

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

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

PACKAGE/ORDERING INFORMATION



28-Pin PLCC (J28-1)

Ordering Information⁽¹⁾

Part Number	Package Type	Operating Range	Package Marking	Lead Finish
SY10E116JI	J28-1	Industrial	SY10E116JI	Sn-Pb
SY10E116JITR ⁽²⁾	J28-1	Industrial	SY10E116JI	Sn-Pb
SY100E116JI	J28-1	Industrial	SY100E116JI	Sn-Pb
SY100E116JITR ⁽²⁾	J28-1	Industrial	SY100E116JI	Sn-Pb
SY10E116JC	J28-1	Commercial	SY10E116JC	Sn-Pb
SY10E116JCTR ⁽²⁾	J28-1	Commercial	SY10E116JC	Sn-Pb
SY100E116JC	J28-1	Commercial	SY100E116JC	Sn-Pb
SY100E116JCTR ⁽²⁾	J28-1	Commercial	SY100E116JC	Sn-Pb
SY10E116JY ⁽³⁾	J28-1	Industrial	SY10E116JY with Pb-Free bar-line indicator	Matte-Sn
SY10E116JYTR ^(2, 3)	J28-1	Industrial	SY10E116JY with Pb-Free bar-line indicator	Matte-Sn
SY100E116JY ⁽³⁾	J28-1	Industrial	SY100E116JY with Pb-Free bar-line indicator	Matte-Sn
SY100E116JYTR ^(2, 3)	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	μA
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 ⁽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 $<1\text{V}$.

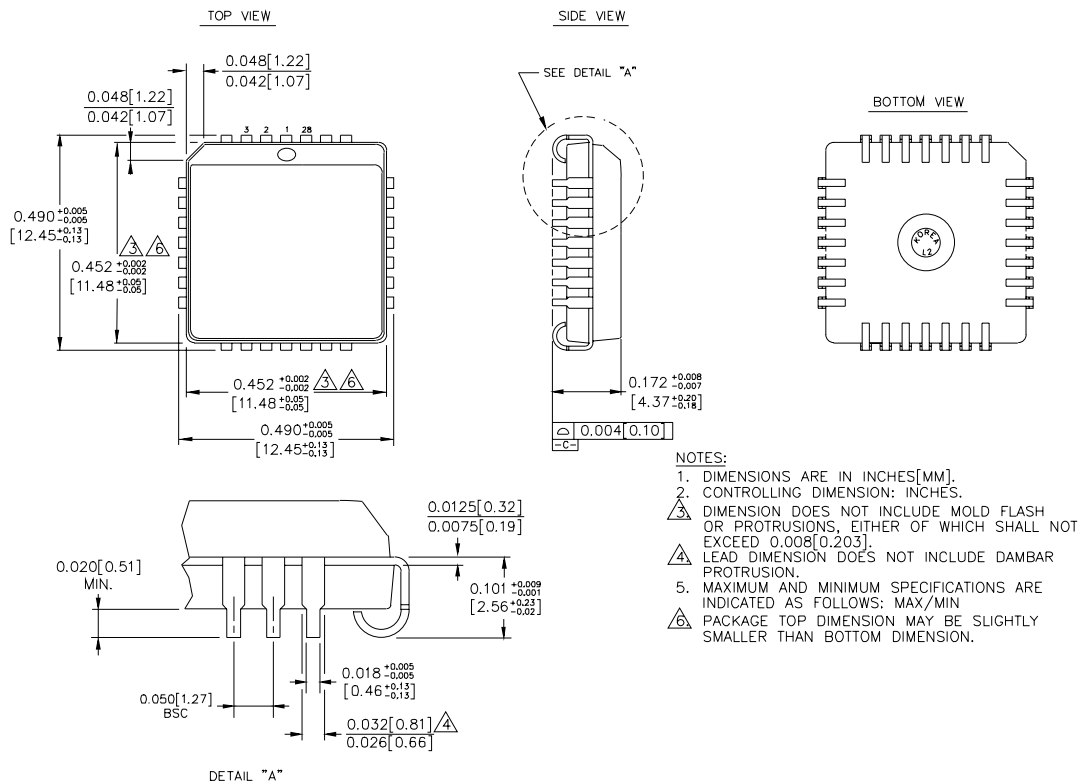
AC ELECTRICAL CHARACTERISTICS

$V_{EE} = V_{EE}(\text{Min.})$ 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_{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 ⁽¹⁾	150	—	150	150	—	—	150	—	—	150	—	—	mV
t_{skew}	Within-Device Skew ⁽²⁾ Dn to Qn, $\overline{Q}_n$	—	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.

28-PIN PLCC (J28-1)

Rev. 03

MICREL, INC. 2180 FORTUNE DRIVE SAN JOSE, CA 95131 USATEL + 1 (408) 944-0800 FAX + 1 (408) 474-1000 WEB <http://www.micrel.com>

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