



**QUINT DIFFERENTIAL
LINE RECEIVER**

**SY10E116
SY100E116**

- 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

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.

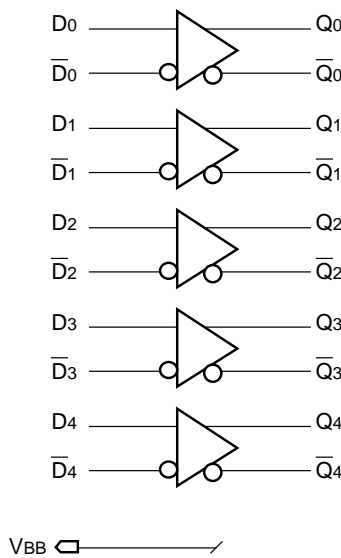
Active current sources combined with Micrel's ASSET™ technology provide the receivers with excellent common mode noise rejection.

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.

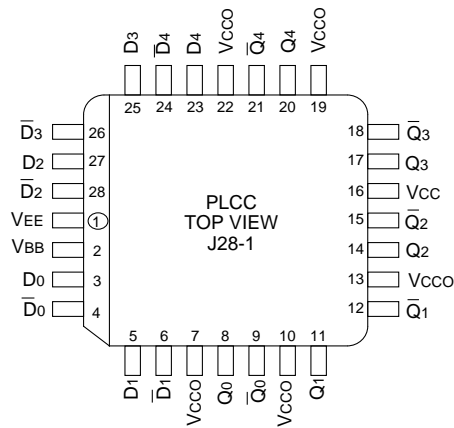
If both inverting and non-inverting inputs are at equal potential, the receiver does *not* go to a defined state, but rather shares current in normal differential amplifier fashion, producing output voltage levels midway between HIGH and LOW.

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 μF capacitor.

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



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



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.

$Q_n = D_n$

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

Symbol	Parameter	TA = -40°C			TA = 0°C			TA = +25°C			TA = +85°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} (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:

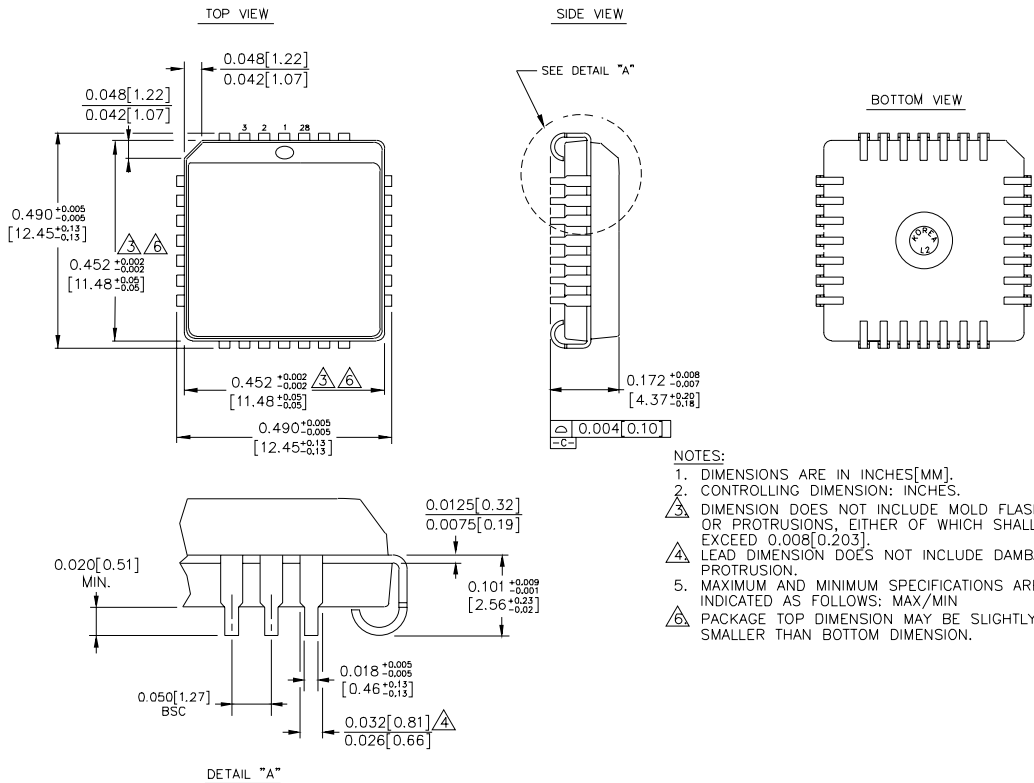
- V_{PP} is the minimum differential input voltage required to assure full ECL levels are present at the outputs.
- V_{CMR} is referenced to the most positive side of the differential input signal. Normal operation is obtained when the "HIGH" input is within the V_{CMR} range and the input swing is greater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

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

Symbol	Parameter	TA = -40°C			TA = 0°C			TA = +25°C			TA = +85°C			Unit	
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.		
t _{PD}	Propagation Delay to Output	D	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} (DC)	Input Sensitivity ⁽¹⁾	150	—	150	150	—	—	150	—	—	150	—	—	mV	
t _{skew}	Within-Device Skew ⁽²⁾ D _n to Q _n , \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 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.



- NOTES:
1. DIMENSIONS ARE IN INCHES[MM].
 2. CONTROLLING DIMENSION: INCHES.
 - Δ DIMENSION DOES NOT INCLUDE MOLD FLASH OR PROTRUSIONS, EITHER OF WHICH SHALL NOT EXCEED 0.008[0.203].
 - Δ LEAD DIMENSION DOES NOT INCLUDE DAMBAR PROTRUSION.
 5. MAXIMUM AND MINIMUM SPECIFICATIONS ARE INDICATED AS FOLLOWS: MAX/MIN
 - Δ PACKAGE TOP DIMENSION MAY BE SLIGHTLY SMALLER THAN BOTTOM DIMENSION.

Rev. 03

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