

**FEATURES**

- Quad PECL version of popular ECLinPS E111
- Low skew
- Guaranteed skew spec
- TTL enable input
- Selectable TTL or PECL clock input
- Single +5V supply
- Differential internal design
- PECL I/O fully compatible with industry standard
- Internal 75kΩ PECL input pull-down resistors
- Available in 16-pin SOIC package



Precision Edge®

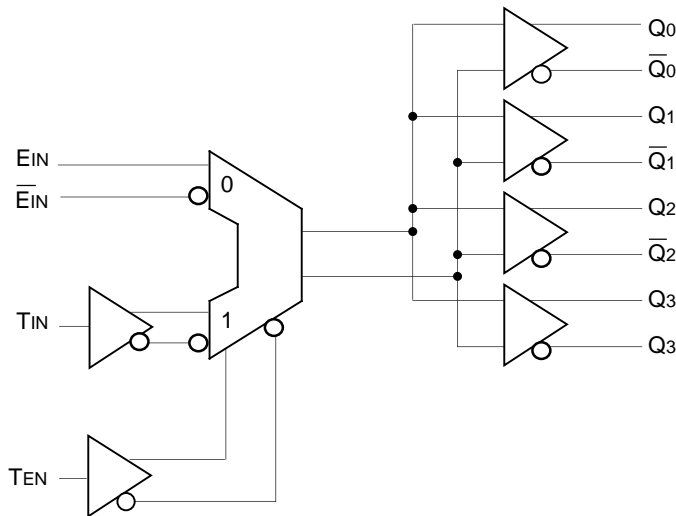
**DESCRIPTION**

The SY100S815 is a low skew 1-to-4 PECL differential driver designed for clock distribution in new, high-performance PECL systems. It accepts either a PECL clock input or a TTL input by using the TTL enable pin TEN. When the TTL enable pin is HIGH, the TTL input is enabled and the PECL input is disabled. When the enable pin is set LOW, the TTL input is disabled and the PECL input is enabled.

The device is specifically designed and produced for low skew. The interconnect scheme and metal layout are carefully optimized for minimal gate-to-gate skew within the device. Wafer characterization and process control ensure consistent distribution of propagation delay from lot to lot. Since the S815 shares a common set of "basic" processing with the other members of the ECLinPS family, wafer characterization at the point of device personalization allows for tighter control of parameters, including propagation delay.

To ensure that the skew specification is met, it is necessary that both sides of the differential output are terminated into 50Ω, even if only one side is being used. In most applications, all nine differential pairs will be used and, therefore, terminated. In the case where fewer than nine pairs are used, it is necessary to terminate at least the output pairs on the same package side (i.e. sharing the same VCC as the pair(s) being used on that side) in order to maintain minimum skew.

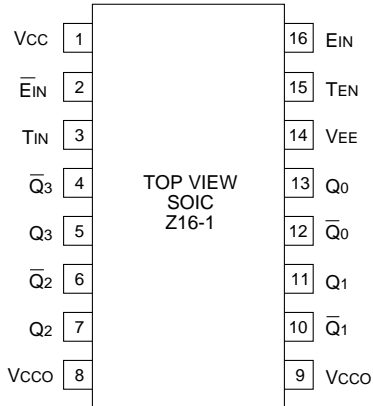
**BLOCK DIAGRAM**



**PIN NAMES**

Pin	Function
EIN, E̅IN	Differential PECL Input Pair
TIN	TTL Input
TEN	TTL Input Enable
Q0, Q̅0 – Q3, Q̅3	Differential PECL Outputs
VCC	PECL Vcc (+5.0V)
VEE	PECL Ground (0V)

**PACKAGE/ORDERING INFORMATION**



**16-Pin SOIC (Z16-1)**

**Ordering Information**

Part Number	Package Type	Operating Range	Package Marking	Lead Finish
SY100S815ZC	Z16-1	Commercial	SY100S815ZC	Sn-Pb
SY100S815ZCTR <sup>(1)</sup>	Z16-1	Commercial	SY100S815ZC	Sn-Pb
SY100S815ZG <sup>(2)</sup>	Z16-1	Industrial	SY100S815ZG with Pb-Free bar-line indicator	NiPdAu Pb-Free
SY100S815ZGTR <sup>(1, 2)</sup>	Z16-1	Industrial	SY100S815ZG with Pb-Free bar-line indicator	NiPdAu Pb-Free

**Notes:**

1. Tape and Reel.
2. Pb-Free package is recommended for new designs.

**TRUTH TABLE**

TEN	EIN	TIN	Q
L	L	X	L
L	H	X	H
H	X	L	L
H	X	H	H

**PECL DC ELECTRICAL CHARACTERISTICS**

VCC = VCCO = +5.0V ± 5%

Symbol	Parameter	TA = 0°C			TA = +25°C			TA = +85°C			Unit
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
I <sub>IH</sub>	Input HIGH Current	—	—	150	—	—	150	—	—	150	μA
I <sub>IL</sub>	Input LOW Current	0.5	—	—	0.5	—	—	0.5	—	—	μA
V <sub>IH</sub>	Input HIGH Voltage <sup>(1)</sup>	3.835	—	4.120	3.835	—	4.120	3.835	—	4.120	V
V <sub>IL</sub>	Input LOW Voltage <sup>(1)</sup>	3.190	—	3.525	3.190	—	3.525	3.190	—	3.525	V
V <sub>OH</sub>	Output HIGH Voltage <sup>(2)</sup>	V <sub>CC</sub> -1025	V <sub>CC</sub> -955	V <sub>CC</sub> -870	V <sub>CC</sub> -1025	V <sub>CC</sub> -955	V <sub>CC</sub> -870	V <sub>CC</sub> -1025	V <sub>CC</sub> -955	V <sub>CC</sub> -870	mV
V <sub>OL</sub>	Output LOW Voltage <sup>(2)</sup>	V <sub>CC</sub> -1890	V <sub>CC</sub> -1705	V <sub>CC</sub> -1620	V <sub>CC</sub> -1890	V <sub>CC</sub> -1705	V <sub>CC</sub> -1620	V <sub>CC</sub> -1890	V <sub>CC</sub> -1705	V <sub>CC</sub> -1620	mV
I <sub>CC</sub>	Power Supply <sup>(3)</sup> Current	—	53	65	—	53	65	—	60	74	mA

**Notes:**

- V<sub>CC</sub> = V<sub>CCO</sub> = 5.0V
- V<sub>IN</sub> = V<sub>IH</sub> (Max.) or V<sub>IL</sub> (Min.) Loading with 50Ω to V<sub>CC</sub> -2V.
- All inputs and outputs open.

**TTL DC ELECTRICAL CHARACTERISTICS**

VCC = VCCO = +5.0V ± 5%

Symbol	Parameter	TA = 0°C			TA = +25°C			TA = +85°C			Unit	Condition
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.		
V <sub>IH</sub>	Input HIGH Voltage	2.0	—	—	2.0	—	—	2.0	—	—	V	
V <sub>IL</sub>	Input LOW Voltage	—	—	0.8	—	—	0.8	—	—	0.8	V	
I <sub>IH</sub>	Input HIGH Current <sup>(1, 2)</sup>	—	—	20	—	—	20	—	—	20	μA	
I <sub>IL</sub>	Input LOW Current <sup>(3)</sup>	—	—	-0.6	—	—	-0.6	—	—	-0.6	mA	
V <sub>IK</sub>	Input Clamp Voltage <sup>(4)</sup>	—	—	-1.2	—	—	-1.2	—	—	-1.2	V	

**Notes:**

- V<sub>IN</sub>=2.7V
- V<sub>IN</sub>=5.0V
- V<sub>IN</sub>=0.5V
- I<sub>IN</sub>=-18mA

**AC ELECTRICAL CHARACTERISTICS<sup>(1-6)</sup>**

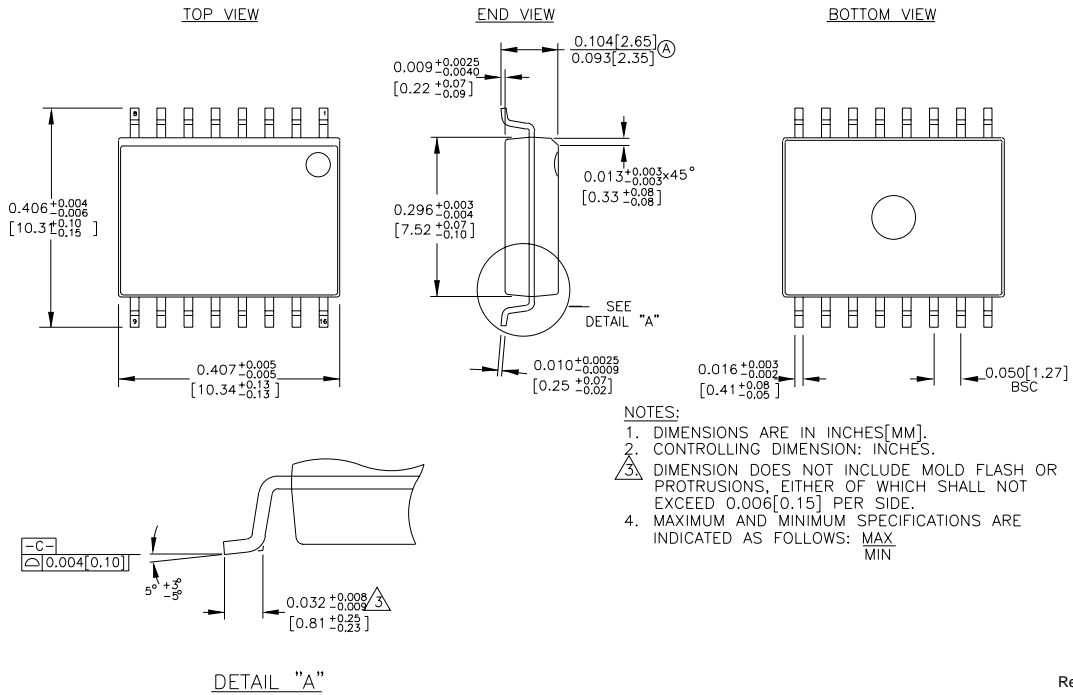
VCC = VCCO = +5.0V ± 5%

Symbol	Parameter	TA = 0°C			TA = +25°C			TA = +85°C			Unit
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
tPLH tPHL	Propagation Delay to Output <sup>(1)</sup> EIN (differential) <sup>(2)</sup> EIN (single-ended) <sup>(3)</sup> TIN	430 330 350	— — —	630 730 950	430 330 350	— — —	630 730 950	430 330 350	— — —	630 730 950	ps
t <sub>skew</sub>	Within-Device skew <sup>(4)</sup>	—	25	50	—	25	50	—	25	50	ps
V <sub>PP</sub>	Minimum PECL <sup>(5)</sup> Input Swing	250	—	—	250	—	—	250	—	—	mV
V <sub>CMR</sub>	PECL Common <sup>(6)</sup> Mode Range	-1.6	—	-0.4	-1.6	—	-0.4	-1.6	—	-0.4	V
t <sub>r</sub> t <sub>f</sub>	Output Rise/Fall Times 20% to 80%	275	375	600	275	375	600	275	375	600	ps

**Notes:**

- Part-to-part skew is defined as Max. — Min. value at the given temperature.
- The differential propagation delay is defined as the delay from the crossing points of the differential input signals to the crossing point of the differential output signals.
- The single-ended propagation delay is defined as the delay from the 50% point of the input signal to the 50% point of the output signal.
- The within-device skew is defined as the worst case difference between any two similar delay paths within a single device.
- V<sub>PP</sub> (min.) is defined as the minimum input differential voltage which will cause no increase in the propagation delay. The V<sub>PP</sub> (min.) is AC limited for the S815, as a differential input as low as 50mV will still produce full PECL levels at the output.
- V<sub>CMR</sub> is defined as the range within which the V<sub>IH</sub> level may vary, with the device still meeting the propagation delay specification. The V<sub>IL</sub> level must be such that the peak-to-peak voltage is less than 1.0V and greater than or equal to V<sub>PP</sub> (min.).

**16-PIN SOIC .300" WIDE (Z16-1)**



Rev. 03

**MICREL, INC. 2180 FORTUNE DRIVE SAN JOSE, CA 95131 USA**

TEL + 1 (408) 944-0800 FAX + 1 (408) 474-1000 WEB <http://www.micrel.com>

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