



# 8-INPUT PECL DIFFERENTIAL MUX WITH TTL SELECTS

SY100S863

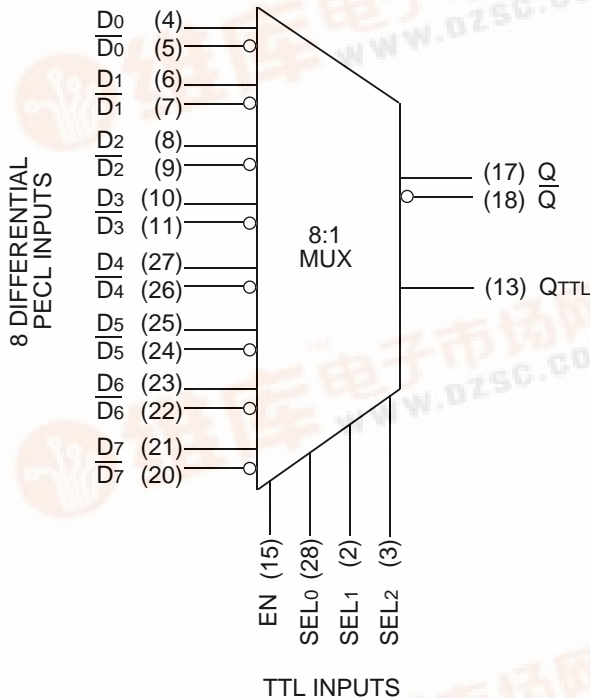
## FEATURES

- Low skew
- Differential PECL inputs
- Differential cut-off PECL outputs capable of driving 25Ω load for driving data bus
- Tri-state TTL output
- TTL select and enable input
- Internal 75KΩ PECL input pull-down resistors
- PECL I/O fully compatible with industry standard
- Available in 28-pin PLCC package

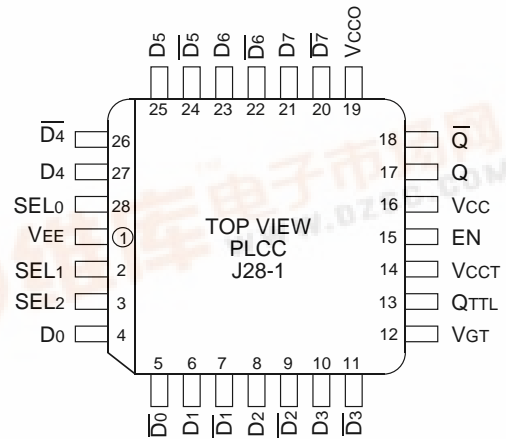
## DESCRIPTION

The SY100S863 is a PECL 8:1 multiplexer designed for use in new, high-performance PECL systems. It has differential PECL outputs and a standard TTL output. The TTL select inputs (SEL0, SEL1, SEL2) determine which one of the eight differential PECL data inputs (D0–D7) is propagated to the outputs. The enable pin, EN, is provided for expansion. When EN is at a TTL logic one level, both PECL and TTL outputs are enabled. When the enable pin is set to TTL logic zero level, both PECL outputs of the differential pair are in cut-off and the TTL output is in a three-state condition.

## BLOCK DIAGRAM



## PIN CONFIGURATION



## PIN NAMES

Pin	Function
D0, /D0 – D7, /D7	Differential PECL Input Pairs
Q, /Q	Differential PECL Outputs
QTTL	TTL Output
EN	Enable Input
SEL0,1,2	Select Inputs



**TRUTH TABLE**

EN	SEL <sub>2</sub>	SEL <sub>1</sub>	SEL <sub>0</sub>	Q	QTTL
H	L	L	L	D <sub>0</sub>	D <sub>0</sub>
H	L	L	H	D <sub>1</sub>	D <sub>1</sub>
H	L	H	L	D <sub>2</sub>	D <sub>2</sub>
H	L	H	H	D <sub>3</sub>	D <sub>3</sub>
H	H	L	L	D <sub>4</sub>	D <sub>4</sub>
H	H	L	H	D <sub>5</sub>	D <sub>5</sub>
H	H	H	L	D <sub>6</sub>	D <sub>6</sub>
H	H	H	H	D <sub>7</sub>	D <sub>7</sub>
L	X	X	X	Z	Z

**PECL DC ELECTRICAL CHARACTERISTICS**

V<sub>CC</sub> = V<sub>CCO</sub> = V<sub>CCT</sub> = 5.0V ± 5%; V<sub>EE</sub> = V<sub>GT</sub> = GND

Symbol	Parameter	Min.	Typ.	Max.	Unit	Condition
V <sub>OH</sub>	Output HIGH Voltage <sup>(1)</sup>	3.975	4.045	4.13	V	Loading with 25Ω to 3V (V <sub>CC</sub> -2V)
V <sub>OL</sub>	Output LOW Voltage <sup>(1)</sup>	3.17	3.295	3.38	V	Loading with 25Ω to 3V (V <sub>CC</sub> -2V)
V <sub>OZ</sub>	Cutoff Voltage <sup>(1)</sup>	—	3	3.10	V	Loading with 25Ω to 3V (V <sub>CC</sub> -2V)
V <sub>IH</sub>	Input HIGH Voltage	3.835	—	4.13	V	
V <sub>IL</sub>	Input LOW Voltage	3.17	—	3.525	V	
I <sub>IH</sub>	Input HIGH Current	—	—	350	μA	V <sub>IN</sub> = V <sub>IH</sub> (Max.)
I <sub>IL</sub>	Input LOW Current	0.50	—	—	μA	V <sub>IN</sub> = V <sub>IL</sub> (Min.)
I <sub>CC</sub>	V <sub>CC</sub> Supply Current	—	73	88	mA	

**NOTE:**

1. Levels shown are for V<sub>CCO</sub> = 5.0V and will vary 1:1 with powers.

**TTL DC ELECTRICAL CHARACTERISTICS**

V<sub>CC</sub> = V<sub>CCO</sub> = V<sub>CCT</sub> = 5.0V ± 5%; V<sub>EE</sub> = V<sub>GT</sub> = GND

Symbol	Parameter	Min.	Typ.	Max.	Unit	Condition
V <sub>OH</sub>	Output HIGH Voltage	2.4	2.9	—	V	I <sub>OH</sub> = -3mA
V <sub>OL</sub>	Output LOW Voltage	—	0.3	0.5	V	I <sub>OL</sub> = 24mA
V <sub>IH</sub>	Input HIGH Voltage	2.0	—	V <sub>CC</sub>	V	
V <sub>IL</sub>	Input LOW Voltage	0	—	0.8	V	
I <sub>IH</sub>	Input HIGH Current	—	—	1.0	mA	V <sub>IN</sub> = 2.7V
I <sub>IL</sub>	Input LOW Current	-0.7	—	—	mA	V <sub>IN</sub> = 0.5V
V <sub>IK</sub>	Input Clamp Voltage	-1.2	—	—	V	I <sub>IN</sub> = -18mA
I <sub>OS</sub>	Output Short Circuit Current	-200	—	-60	mA	V <sub>OUT</sub> = 0V, V <sub>CCT</sub> = 5.5V
I <sub>OZHT</sub>	Tri-state Current Output HIGH	—	—	70	μA	V <sub>OUT</sub> = 2.7V
I <sub>OZLT</sub>	Tri-state Current Output LOW	-700	—	—	μA	V <sub>OUT</sub> = 0.5V

## PECL AC ELECTRICAL CHARACTERISTICS

VCC = VCCO = +5.0V ± 5%; VEE = VGT = GND

Symbol	Parameter	TA = 0°C			TA = +25°C			TA = +85°C			Unit	Condition
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.		
tPLH	Propagation Delay <sup>(1),(2)</sup>										ps	
tPHL	D to Q	500	—	900	500	—	900	500	—	900		
	SEL0 to Q	300	—	2000	300	—	2000	300	—	2000		
	SEL1 to Q	300	—	1750	300	—	1750	300	—	1750		
	SEL2 to Q	300	—	1500	300	—	1500	300	—	1500		
tPZH	EN to Q <sup>(3)</sup> (Cutoff to HIGH)	300	—	1750	300	—	1750	300	—	1750	ps	
tPHZ	EN to Q <sup>(3)</sup> 300 (HIGH to Cutoff)	—	1300	300	—	1300	300	—	1300			
tr	Output Rise/Fall Times <sup>(2)</sup> 20% to 80%	300	400	600	300	400	600	300	400	600	ps	
tf												

### NOTES:

1. Part-to-part skew is defined as Max. – Min. value at the given temperature.
2. RL = 50Ω
3. Figures 1 and 2

## TTL AC ELECTRICAL CHARACTERISTICS

VCC = VCCO = 5V ± 5%; VEE = VGT = GND

Symbol	Parameter	TA = 0°C			TA = +25°C			TA = +85°C			Unit	Condition
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.		
tPLH	Propagation Delay <sup>(1),(2)</sup>										ns	
tPHL	D to QTTL	2.5	—	5.0	2.5	—	5.0	2.5	—	5.0		
	SEL0 to QTTL	2.5	—	5.0	2.5	—	5.0	2.5	—	5.0		
	SEL1 to QTTL	2.5	—	5.0	2.5	—	5.0	2.5	—	5.0		
	SEL2 to QTTL	2.5	—	5.0	2.5	—	5.0	2.5	—	5.0		
tPZH	EN to TTL Output <sup>(2)</sup>	2.5	—	5.0	2.5	—	5.0	2.5	—	5.0	ns	
tPZL	(Enable Time)	2.5	—	5.0	2.5	—	5.0	2.5	—	5.0		
tPHZ	EN to TTL Output <sup>(2)</sup>	2.5	—	5.0	2.5	—	5.0	2.5	—	5.0	ns	
tPLZ	(Disable Time)	2.5	—	5.0	2.5	—	5.0	2.5	—	5.0		
tr	Output Rise/Fall Time <sup>(3)</sup> 0.8V to 2.4V	0.3	—	1.6	0.3	—	1.6	0.3	—	1.6	ns	
tf												

### NOTES:

1. Part-to-part skew is defined as Max. – Min. value at the given temperature.
2. Figures 3 and 4
3. CL = 25pF

**PECL-TO-PECL TEST CIRCUITRY**

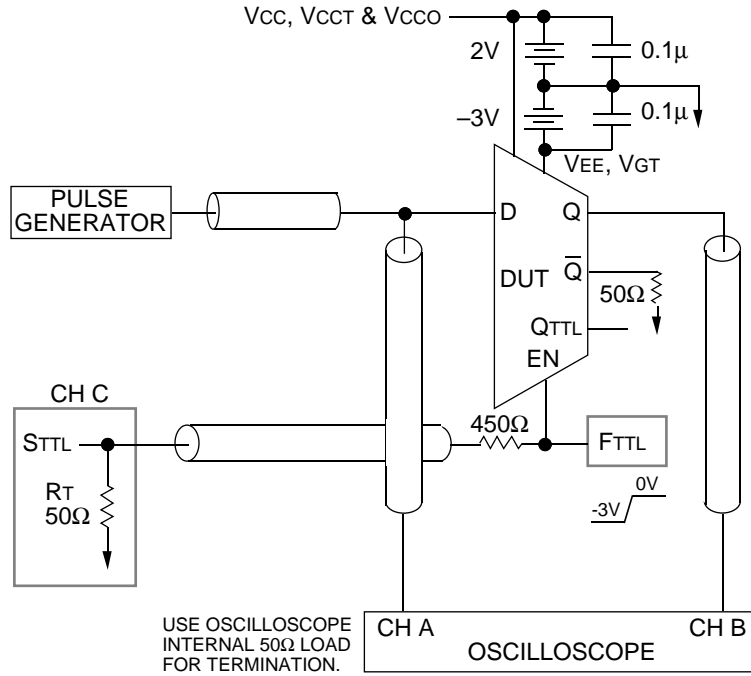


Figure 1. PECL-to-PECL AC Test Circuit

**PECL-TO-PECL SWITCHING WAVEFORMS**

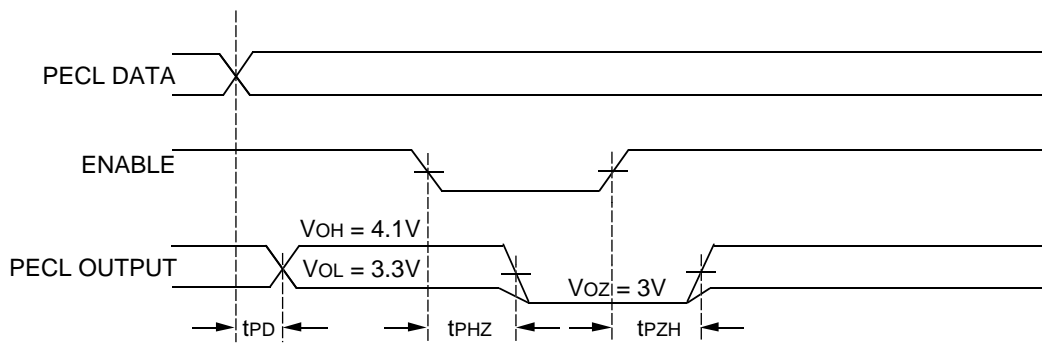


Figure 2. PECL-to-PECL Transition — Propagation Delay and Transition Times

**PECL-TO-TTL TEST CIRCUITRY**

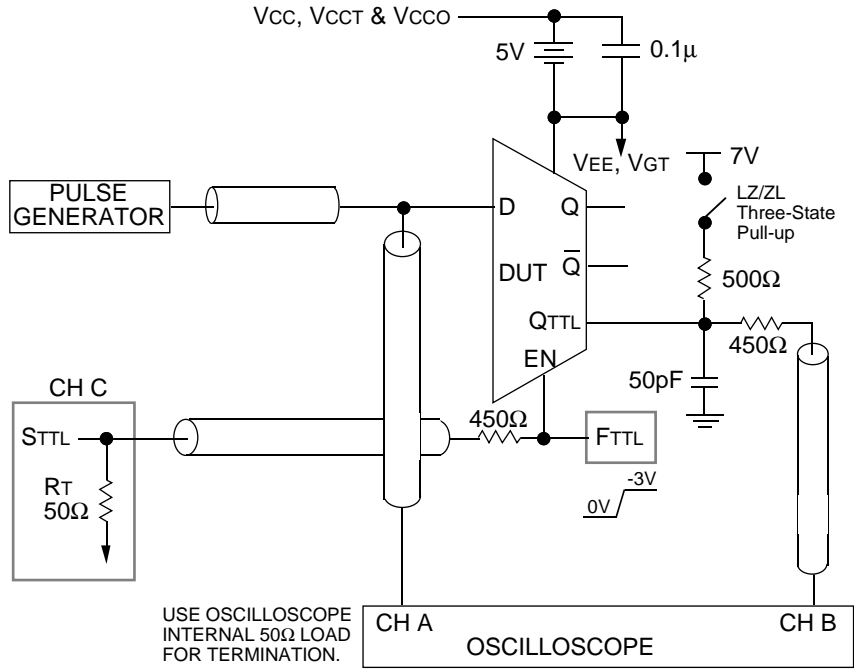


Figure 3. PECL-to-TTL AC Test Circuit

**PECL-TO-TTL SWITCHING WAVEFORMS**

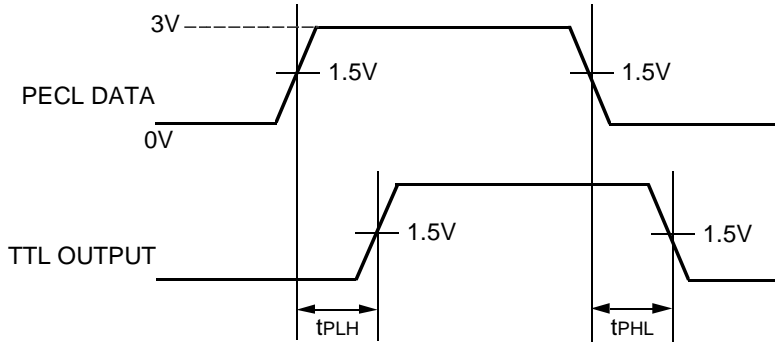


Figure 4a. PECL-to-TTL Transition, Data to TTL Output Delay

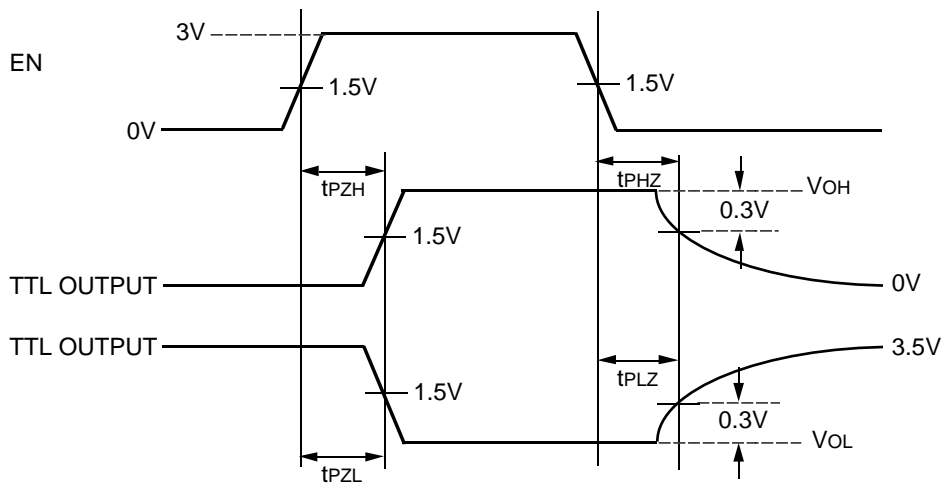
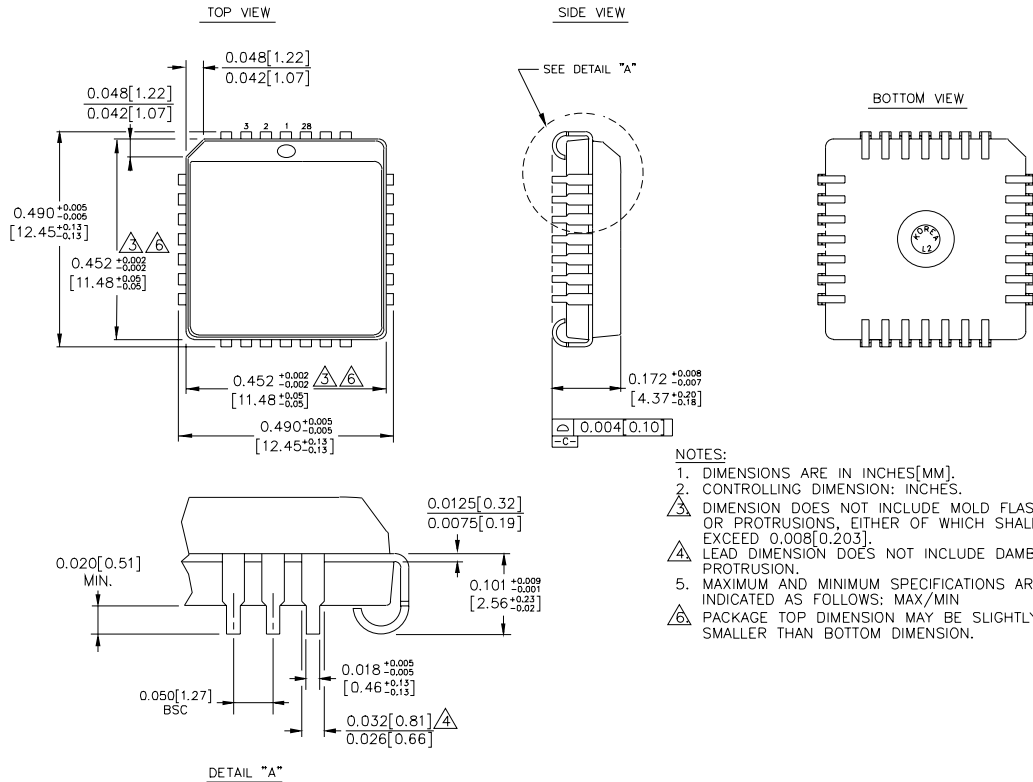


Figure 4b. EN to TTL Output Enable and Disable Times

**PRODUCT ORDERING CODE**

Ordering Code	Package Type	Operating Range
SY100S863JC	J28-1	Commercial
SY100S863JCTR	J28-1	Commercial

**28 LEAD PLCC (J28-1)**



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