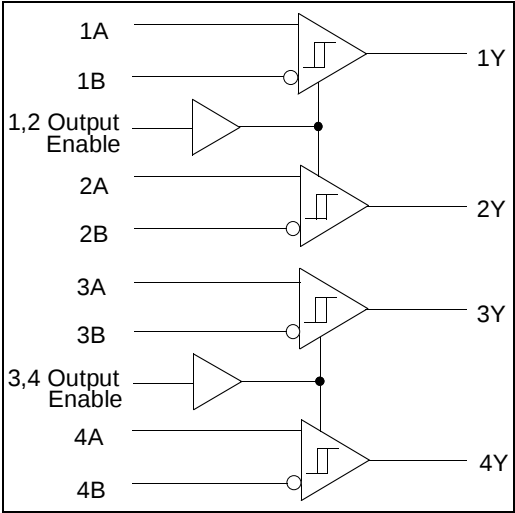


HD293486

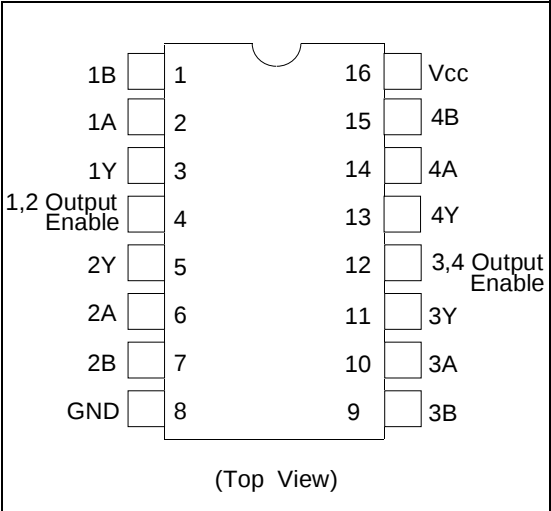
Quadruple Differential Line Receivers With 3 State Outputs

The HD293486 features quadruple Differential line receivers designed to meet the specs of EIA RS-422A and RS-423A. This device operates from a single 5 V power supply. When the enable input is low the associated outputs are in a high impedance state.

Logic Diagram



Pin Arrangement



Function Table

Differential Input A – B	Output Enable	Output Y
$V_{ID} \geq 0.2 \text{ V}$	H	H
$-0.2 \text{ V} < V_{ID} < 0.2 \text{ V}$	H	?
$V_{ID} \leq -0.2 \text{ V}$	H	L
X	L	Z

- H : High level
- L : Low level
- X : Irrelevant
- ? : Indeterminate
- Z : High Impedance

Absolute Maximum Ratings

Item	Symbol	Ratings	Unit
Supply Voltage	V _{CC} *2	7.0	V
A , B Input Voltage	V _{IN}	±15.0	V
Differential Input Voltage	V _{ID} *3	±25.0	V
Enable Input Voltage	V _{IE}	7.0	V
Output Current	I _{OL}	50	mA
Power Dissipation	P _T	*1 DP	mW
		FP	
		785	
Operating Temperature	T _{opr}	0 to +70	°C
Storage Temperature	T _{stg}	−65 to +150	°C

Notes: 1. The above data were taken by the ΔV_{EB} method mounting on a glass epoxy board (40 × 40 × 1.6 mm) of 10 % wiring density.

2. All voltage values except for differential input voltage are with respect to ground terminal.

3. Differential input voltage is measured at the noninverting input with respect to the corresponding inverting input.

4. The absolute maximum ratings are values which must not individually be exceeded, and furthermore, no two of which may be realized at the same time.

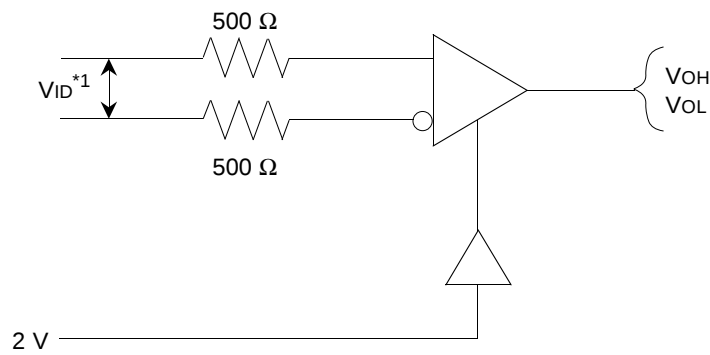
Recommended Operating Conditions

Item	Symbol	Min	Typ	Max	Unit
Supply Voltage	V _{CC}	4.75	5.00	5.25	V
In Phase Input Voltage	V _{IC}	—	—	±7	V
Differential Input Voltage	V _{ID}	—	—	±6	V
Output Current	I _{OH}	—	—	−0.4	mA
	I _{OL}	—	—	8.0	mA
Operating Temperature	T _{opr}	0	—	70	°C

Electrical Characteristics (Ta = 0 to +70°C)

Item	Symbol	Conditions	Min	Typ	Max	Unit
Differential Input High Threshold Voltage	VTH	Vo = 2.7 V, Io = −0.4 mA	—	—	0.2	V
Differential Input Low Threshold Voltage	VTL	Vo = 0.5 V, Io = 8 mA	—	—	−0.2	V
Enable Input Voltage	VIH		2.0	—	—	V
	VIL		—	—	0.8	
Input Clamp Voltage	VIK	Ii = −10 mA	—	—	−1.5	V
Output Voltage	VOH	VID*1 = 0.4 V, Io = −0.4 mA	2.7	—	—	V
	VOL	VID*1 = −0.4 V, Io = 8 mA	—	—	0.5	
Off State Output Current	Ioz	VIe = 0.8 V, VID = −3 V, Vo = 2.7 V	—	—	40	μA
	Ioz	VIe = 0.8 V, VID = 3V, Vo = 0.5V	—	—	40	
Differential Input Bias Current	IIB	Vcc = 0 V or 5.25 V Other Input = 0 V	Vi = −10 V	—	—	−3.25
			Vi = −3 V	—	—	−1.5
			Vi = 3 V	—	—	1.5
			Vi = 10 V	—	—	3.25
Enable Input Current	IiH	Vi = 5.25 V	—	—	100	μA
	IiH	Vi = 2.7 V	—	—	20	
	IiL	Vi = 0.5 V	—	—	−100	
Short Circuit Output Current	Ios*2	VID = 3 V, Vo = 0 V	−15	—	−100	mA
Supply Current	Icc	VIe = 0 V	—	—	85	mA

Note: 1. Not more than one output should be shorted at a time.



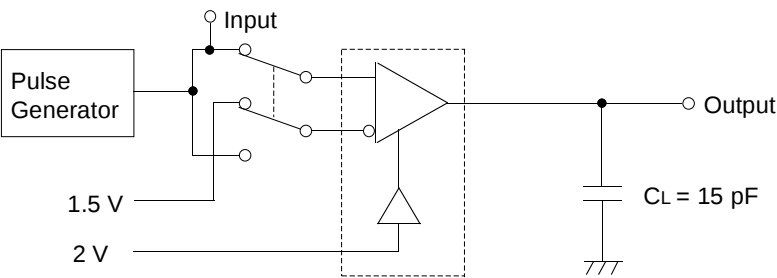
Switching Characteristics (V_{CC} = 5 V, T_a = 25°C)

Item	Symbol	Conditions	Min	Typ	Max	Unit
Propagation Delay Time	t _{PHL}	C _L = 15 pF	—	28	35	ns
	t _{PLH}		—	27	30	
Output Disable Time	t _{HZ}		—	26	35	ns
	t _{LZ}		—	27	35	
Output Enable Time	t _{ZH}		—	13	30	ns
	t _{ZL}		—	20	30	

Switching Time Test Method

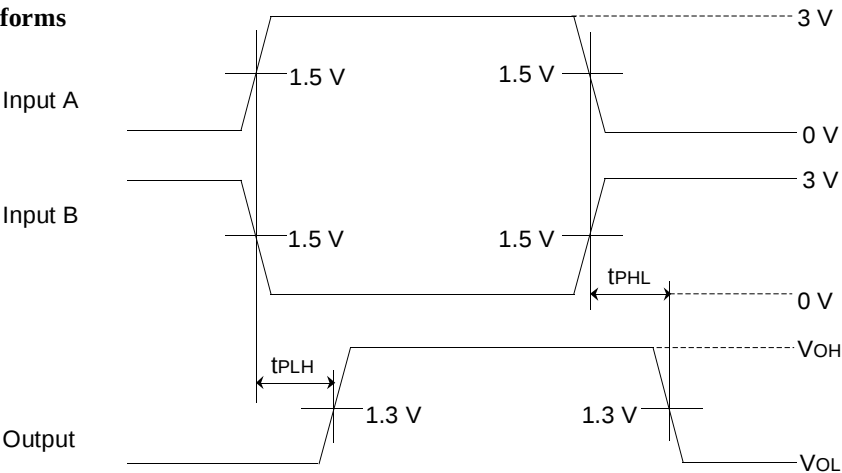
1. t_{PLH} , t_{PHL}

Test circuit



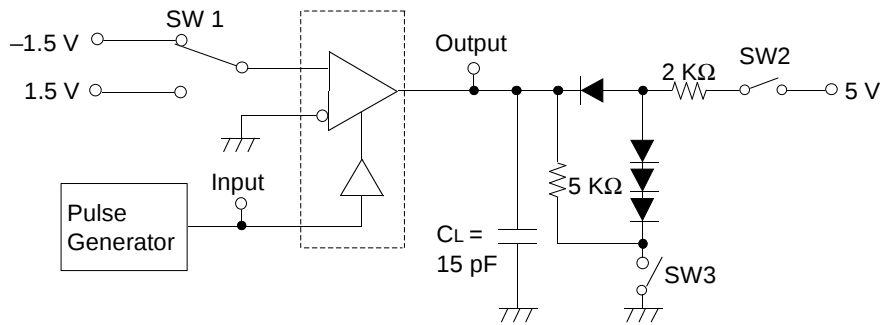
- Notes : 1. The pulse generator has following characteristics:
PRR = 1 MHz, 50 % duty cycle, tr ≤ 6ns, tf ≤ 6ns, Zout = 50 Ω
2. CL includes probe and jig capacitance.

Waveforms



2. tHZ, tZH, tLZ, tZL

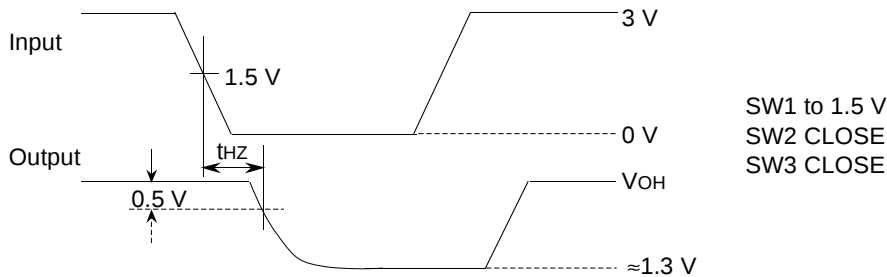
Test circuit



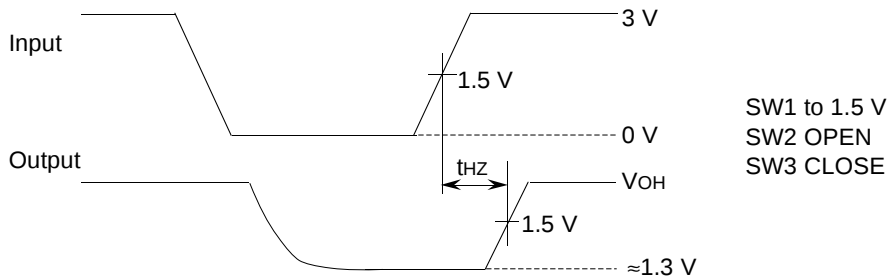
- Notes: 1. The pulse generator has following characteristics:
PRR = 1 MHz, 50 % duty cycle, $t_r \leq 6 \text{ ns}$, $t_f \leq 6 \text{ ns}$, $Z_{out} = 50 \Omega$
2. CL includes probe and jig capacitance.
3. All diodes are 1S2074(H)

Waveforms

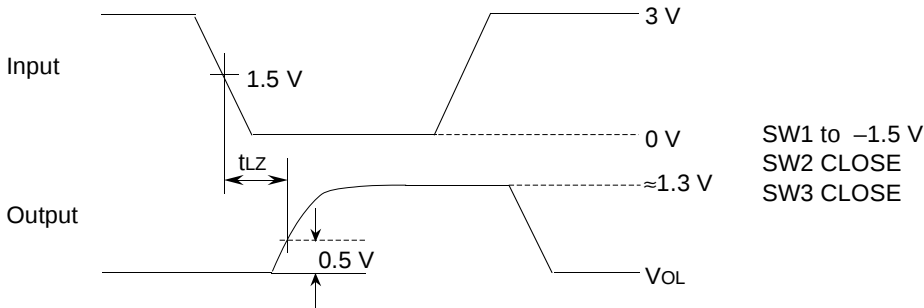
(1) tHZ



(2) tZH



(3) t_{LZ}



(4) t_{ZL}

