

# HD75173

## Quadruple Differential Line Receivers With 3 State Outputs

REJ03D0310-0200Z  
 (Previous ADE-205-592 (Z))  
 Rev.2.00  
 Jul.16.2004

### Description

The HD75173 is a quadruple differential line receiver with three state outputs. It is designed to satisfy the requirements of EIA standards RS-422A, RS-423A and several CCITT recommendations. Each receiver features an active high enable and an active low enable common to all four receivers. It also features differential input sensitivity of  $\pm 200$  mV.

### Features

- Ordering Information

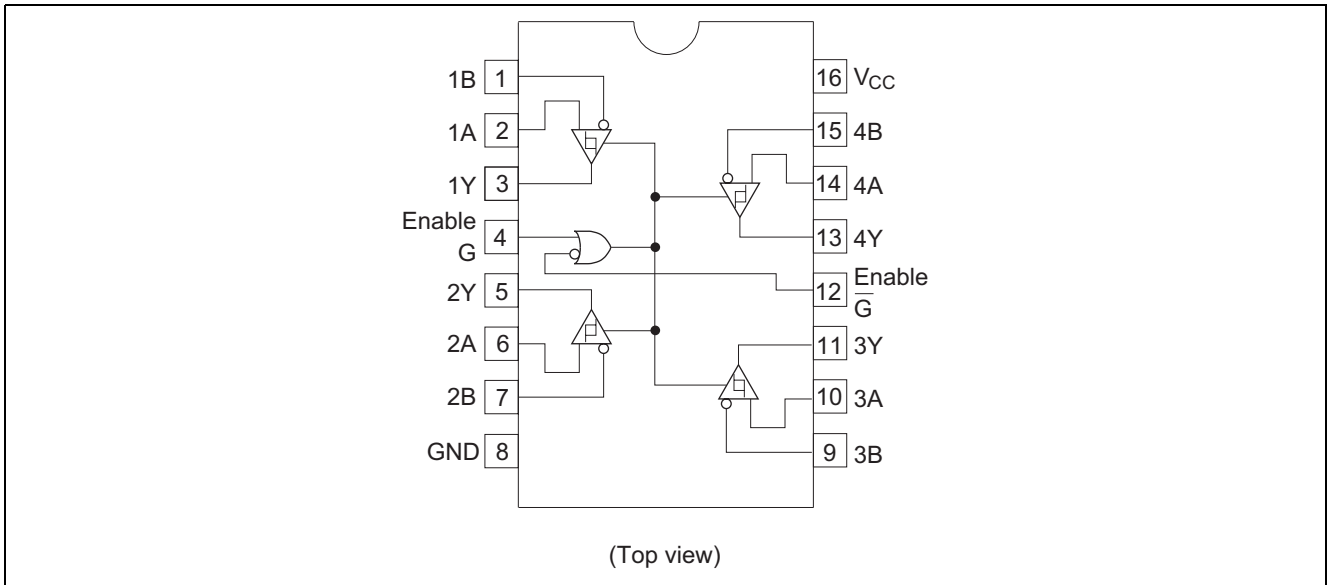
Part Name	Package Type	Package Code	Package Abbreviation	Taping Abbreviation (Quantity)
HD75173P	DILP-16 pin	DP-16E, -16FV	P	—

### Function Table

Differential Inputs A-B	Enables		Output Y
	G	$\bar{G}$	
$V_{ID} \geq 0.2$ V	H	X	H
	X	L	H
$-0.2$ V $< V_{ID} < 0.2$ V	H	X	?
	X	L	?
$V_{ID} \leq -0.2$ V	H	X	L
	X	L	L
X	L	H	Z

H : High level  
 L : Low level  
 X : Irrelevant  
 ? : Indeterminate  
 Z : High impedance

Pin Arrangement



Absolute Maximum Ratings (Ta = 0 to 70°C)

Item	Symbol	Rating	Unit
Supply Voltage	$V_{CC}$	7	V
Input Voltage, A or B Inputs	$V_{IN}$	±25	V
Differential Input Voltage*1	$V_{ID}$	±25	V
Enable Input Voltage	$V_{IE}$	7	V
Output Current	$I_{OL}$	50	mA
Power Dissipation (Ta = 25°C)	$P_T$	1150	mW
Operating temperature range	$T_{opr}$	0 to 70	°C
Storage Temperature Range	$T_{stg}$	-65 to +150	°C

- Notes: 1. Differential input voltage is measured at the noninverting input with respect to the corresponding inverting input
2. 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
Common Mode Input Voltage	$V_{IN}$	—	—	±12	V
Differential Input Voltage	$V_{ID}$	—	—	±12	V
Output Current	$V_{OH}$	—	—	-400	μA
	$V_{OL}$	—	—	16	mA
Operating Temperature	$T_{opr}$	0	—	70	°C

**DC Electrical Characteristics (Ta = 0 to 70°C)**

Item	Symbol	Min	Typ *1	Max	Unit	Conditions
Differential Input High Threshold Voltage	$V_{TH}$	—	—	0.2	V	$V_O = 2.7\text{ V}, I_O = -0.4\text{ mA}$
Differential Output Low Threshold Voltage	$V_{TL}$	-0.2*2	—	—	V	$V_O = 0.5\text{ V}, I_O = 16\text{ mA}$
Hysteresis	$V_{T^+} - V_{T^-}$	—	50	—	mV	
Enable Input Voltage	$V_{IH}$	2	—	—	V	
	$V_{IL}$	—	—	0.8		
Enable Input Clamp Voltage	$V_{IK}$	—	—	-1.5	V	$I_I = -18\text{ mA}$
Output Voltage	$V_{OH}$	2.7	—	—	V	$V_{ID} = 200\text{ mV}, I_{OH} = -400\text{ }\mu\text{A}$
	$V_{OL}$	—	—	0.45	V	$V_{ID} = -200\text{ mV}, I_{OL} = 8\text{ mA}$
		—	—	0.5		$V_{ID} = -200\text{ mV}, I_{OL} = 16\text{ mA}$
High Impedance State Output Current	$V_{OZ}$	—	—	-20	$\mu\text{A}$	$V_O = 0.4\text{ V}$
		—	—	+20		$V_O = 2.4\text{ V}$
Line Input Current	$I_I$	—	—	1	mA	Other Input at 0 V*4
		—	—	-0.8		
Enable Input Current	$I_{IH}$	—	—	20	$\mu\text{A}$	$V_{IH} = 2.7\text{ V}$
	$I_{IL}$	—	—	-100	$\mu\text{A}$	$V_{IL} = 0.4\text{ V}$
Input Resistance	$r_i$	12	—	—	k $\Omega$	
Short Circuit Output Current*3	$I_{OS}$	-15	—	-85	mA	
Supply Current	$I_{CC}$	—	—	70	mA	

Notes: 1. All Typical Values are at  $V_{CC} = 5\text{ V}, T_a = 25^\circ\text{C}$

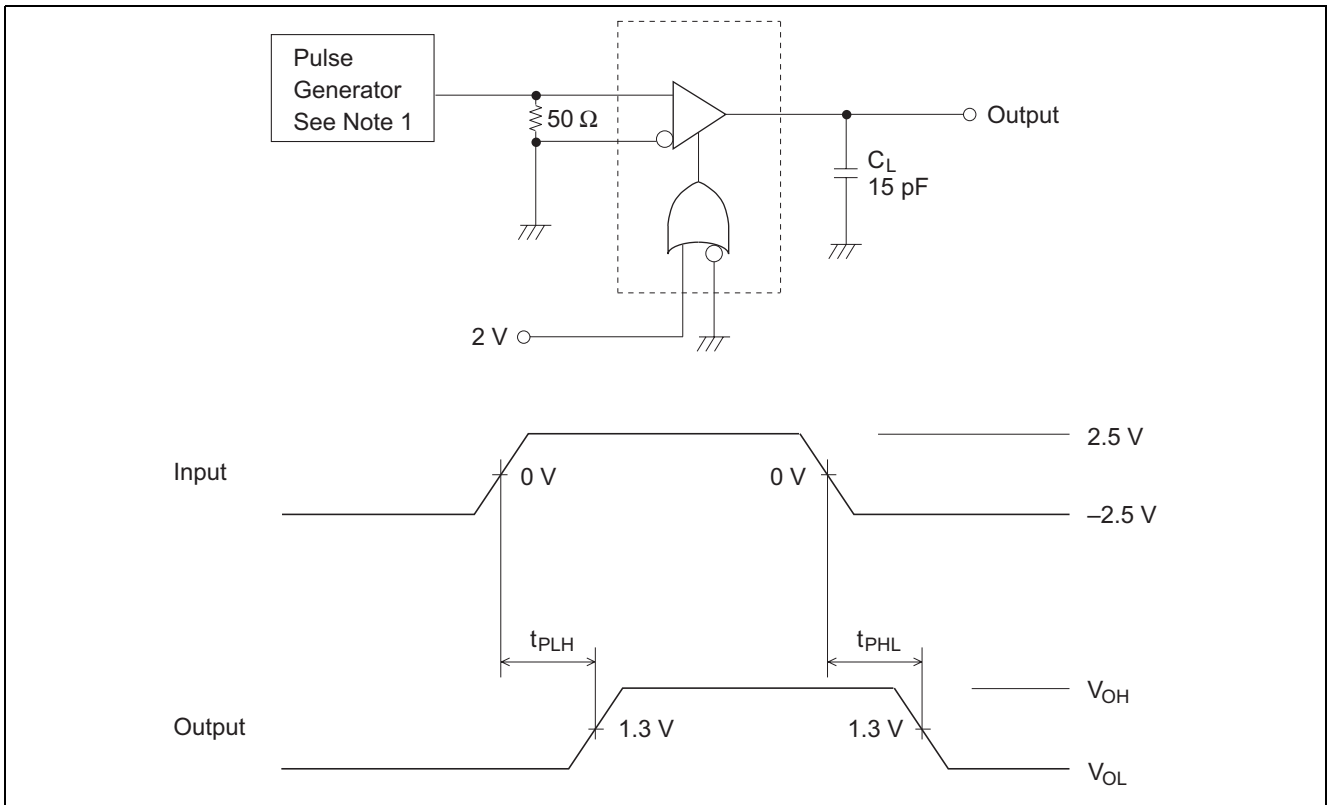
2. The algebraic convention is used in this data sheet for threshold voltage levels only.
3. Not more than one output should be shorted at a time.
4. Refer to EIA standards RS-422A and RS-423A for exact conditions.

**Switching Characteristics ( $V_{CC} = 5\text{ V}, T_a = 25^\circ\text{C}$ )**

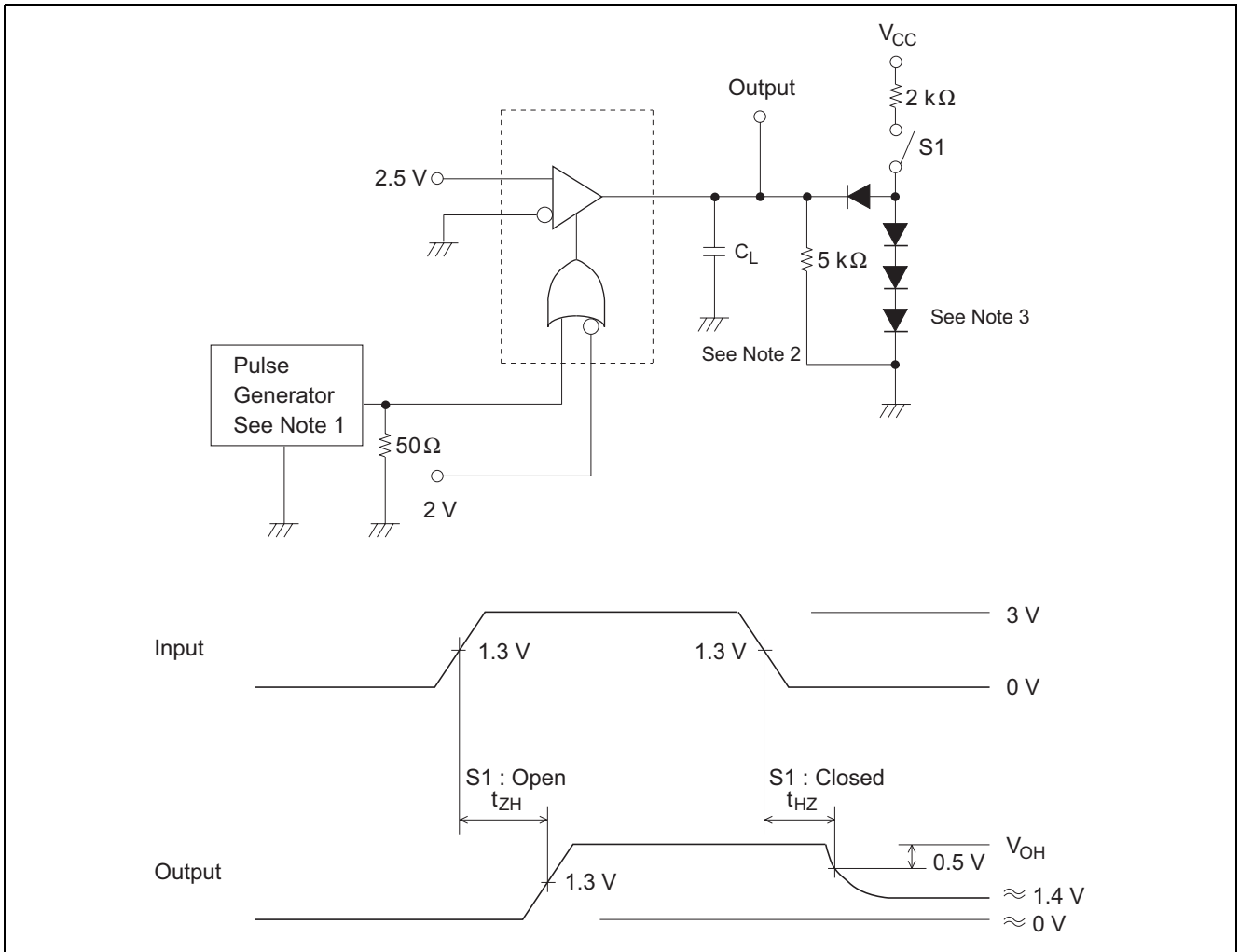
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Propagation Delay Time	$t_{PLH}$	—	20	35	ns	$C_L = 15\text{ pF}$
	$t_{PHL}$	—	22	35		
Output Enable Time	$t_{ZH}$	—	17	22		$C_L = 15\text{ pF}$
	$t_{ZL}$	—	20	25		
Output Disable Time	$t_{HZ}$	—	21	30		
	$t_{LZ}$	—	30	40		

## Switching Time Test Method

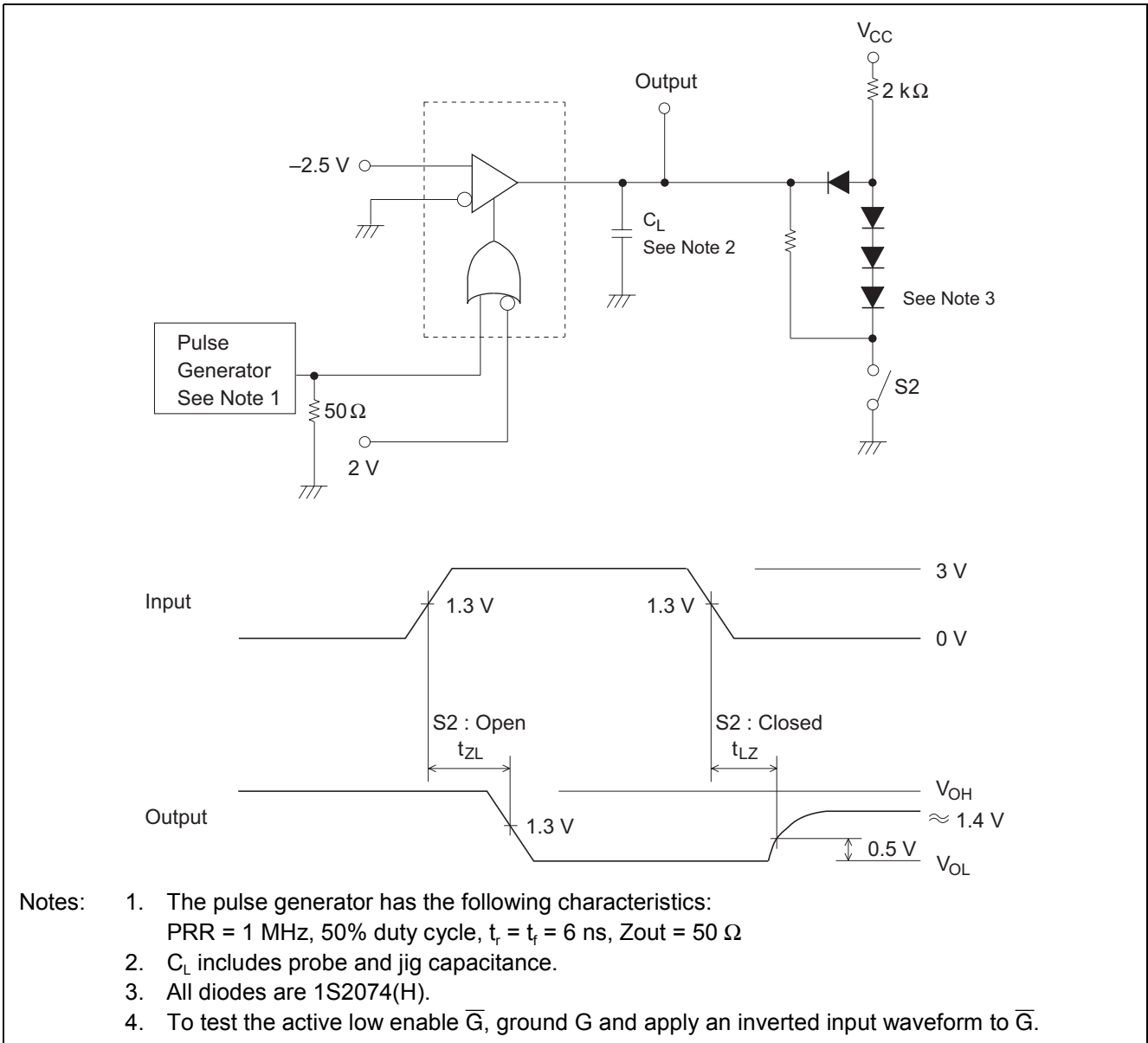
### 1. $t_{PLH}$ , $t_{PHL}$



2.  $t_{ZH}$ ,  $t_{ZL}$

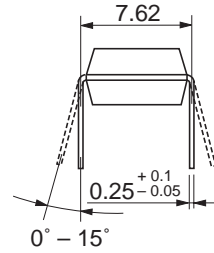
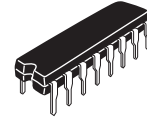
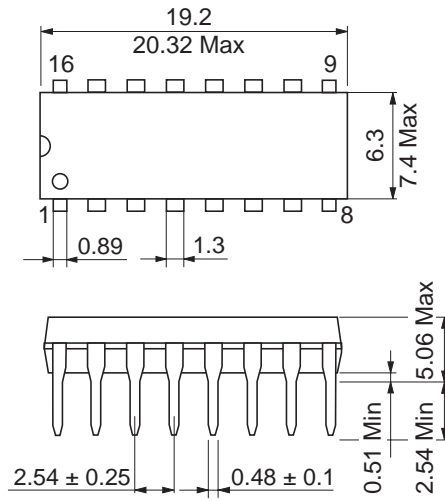


3.  $t_{zL}$ ,  $t_{Lz}$



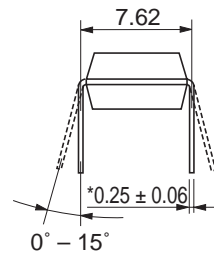
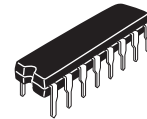
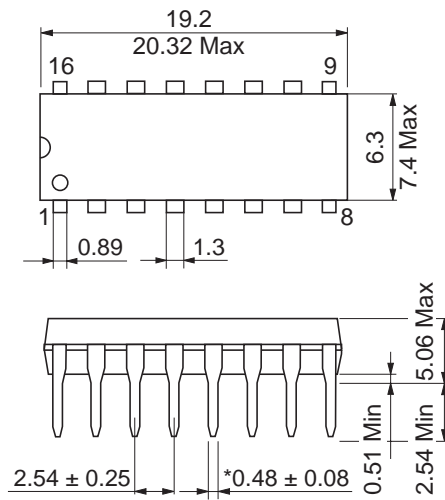
Package Dimensions

As of January, 2003  
Unit: mm



Package Code	DP-16E
JEDEC	Conforms
JEITA	Conforms
Mass (reference value)	1.05 g

Unit: mm



\*Ni/Pd/AU Plating

Package Code	DP-16FV
JEDEC	Conforms
JEITA	Conforms
Mass (reference value)	1.05 g

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