

HD14503B

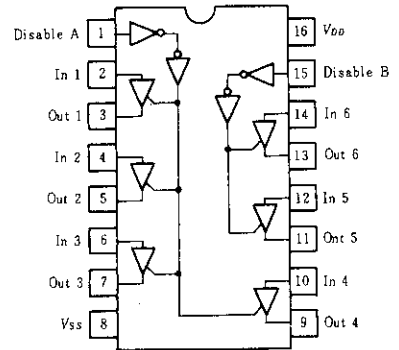
Hex Non-inverting 3-state Buffer

The HD14503B is a hex non-inverting buffer with 3-state outputs, and a high current source and sink capability. The 3-state outputs make it useful in common bussing applications. Two disable controls are provided. A high level on the Disable A input causes the outputs of buffers 1 through 4 to go into a high impedance state and a high level on the Disable B input causes the outputs of buffers 5 and 6 to go into a high impedance state.

FEATURES

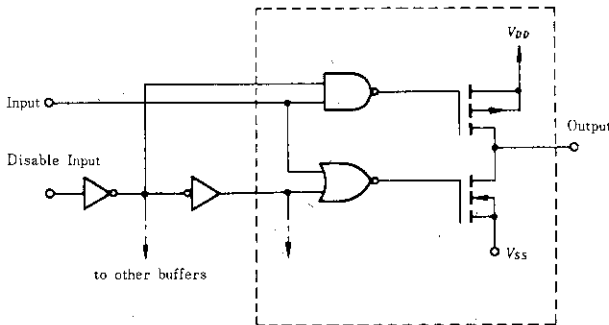
- 3-state Outputs
- TTL Compatible ... Will Drive One TTL Load Over Full Temperature Range
- Supply Voltage Range = 3 to 18V
- Symmetrical Turn-on and Turn-off Delays
- Symmetrical Output Rise and Fall Times
- Two Disable Controls for Added Versatility
- Pin-for-Pin Replacement for MC14503B

PIN ARRANGEMENT



(Top View)

LOGIC DIAGRAM



Diode protection on all inputs(not shown)

TRUTH TABLE

In	Disable	Out
0	0	0
1	0	1
×	1	High Impedance

× - Don't Care

MAXIMUM RATINGS (Voltages referenced to V_{SS})

Characteristic	Symbol	Value	Unit
DC Supply Voltage	V_{DD}	-0.5~+18	V
Input Voltage	V_{is}	-0.5~ $V_{DD}+0.5$	V
Output Voltage	V_{out}	-0.5~ $V_{DD}+0.5$	V
DC Current Drain per Input Pin	I_{is}	10	mA
DC Current Drain per Output Pin	I_{out}	25	mA
Operating Temperature Range	T_A	-40~+85	°C
Storage Temperature Range	T_{stg}	-65~+150	°C
Power Dissipation	P_D	300	mW

ELECTRICAL CHARACTERISTICS

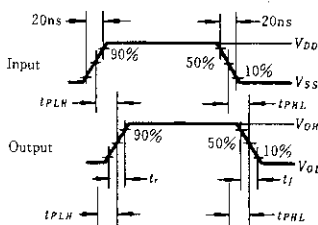
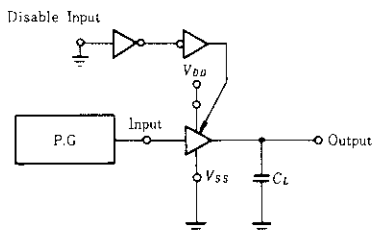
Characteristic	Symbol	V _{DD} (V)	Test Conditions	-40°C		25°C			85°C		Unit	
				min	max	min	typ	max	min	max		
Output Voltage	V _{OL}	5.0	V _{in} = V _{DD} or 0	—	0.05	—	0	0.05	—	0.05	V	
		10		—	0.05	—	0	0.05	—	0.05		
		15		—	0.05	—	0	0.05	—	0.05		
	V _{OH}	5.0	V _{in} = 0 or V _{DD}	4.95	—	4.95	5.0	—	4.95	—	V	
		10		9.95	—	9.95	10	—	9.95	—		
		15		14.95	—	14.95	15	—	14.95	—		
Input Voltage	V _{IL}	5.0	V _{out} = 3.6 or 1.4V	—	1.5	—	2.25	1.5	—	1.5	V	
		10	V _{out} = 7.2 or 2.8V	—	3.0	—	4.50	3.0	—	3.0		
		15	V _{out} = 11.5 or 3.5V	—	3.75	—	6.75	3.75	—	3.75		
	V _{IH}	5.0	V _{out} = 1.4 or 3.6V	3.5	—	3.5	2.75	—	3.5	—	V	
		10	V _{out} = 2.8 or 7.2V	7.0	—	7.0	5.5	—	7.0	—		
		15	V _{out} = 3.5 or 11.5V	11.25	—	11.25	8.25	—	11.25	—		
Output Drive Current	I _{OH}	4.75	V _{OH} = 2.5V	-4.30	—	-3.60	-7.25	—	-2.60	—	mA	
		5.0	V _{OH} = 2.5V	-5.00	—	-4.20	-8.40	—	-3.40	—		
		5.0	V _{OH} = 4.6V	-1.04	—	-0.88	-1.76	—	-0.72	—		
		10	V _{OH} = 9.5V	-2.60	—	-2.20	-4.50	—	-1.80	—		
	I _{OL}	4.75	V _{OL} = 0.4V	1.7	—	1.4	2.65	—	1.1	—	mA	
		5.0	V _{OL} = 0.4V	1.9	—	1.6	2.75	—	1.3	—		
Input Current	I _{in}	15	V _{in} = 0	—	±0.3	—	±0.0001	±3.0	—	±1.0	μA	
		Input Capacitance	C _{in}	V _{in} = 0	—	—	—	5.0	7.5	—	—	pF
					Quiescent Current	I _{DD}	5.0	Zero Signal, per Package	—	1.0	—	0.002
10	—	2.0	—	0.004	2.0		—		60			
15	—	4.0	—	0.006	4.0		—		120			
Total Supply Current*	I _T	5.0	Dynamic + I _{DD} ,	—	—	—	2.5	—	—	—	μA	
		10	per Gate	—	—	—	6.0	—	—	—		
		15	C _L = 50pF, f = 1kHz	—	—	—	10	—	—	—		
Three-State Output Leakage Current	I _{TL}	15		—	±1.0	—	±0.0001	±1.0	—	±7.5	μA	

* To calculate total supply current at frequency other than 1kHz.

@ V_{DD} = 5.0V I_T = (2.5μA/kHz) f + I_{DD}, @ V_{DD} = 10V I_T = (6.0μA/kHz) f + I_{DD}, @ V_{DD} = 15V I_T = (10μA/kHz) f + I_{DD}

SWITCHING TIME TEST CIRCUIT

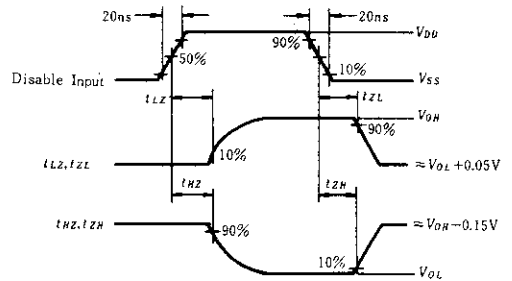
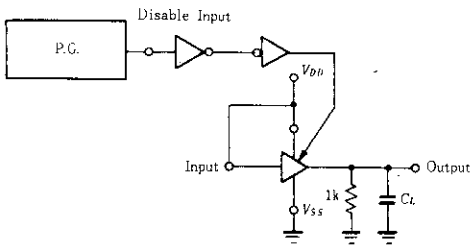
● t_{PLH}, t_{PHL}



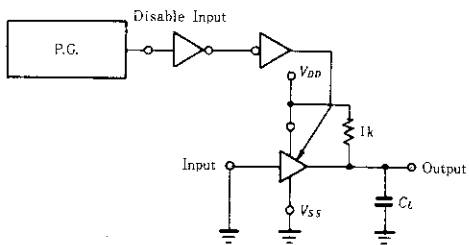
■SWITCHING CHARACTERISTICS ($C_L=50\text{pF}$, $T_a=25^\circ\text{C}$)

Characteristic	Symbol	V_{DD} (V)	min	typ	max	Unit
Output Rise Time	t_r	5.0	—	45	90	ns
		10	—	23	45	
		15	—	18	35	
Output Fall Time	t_f	5.0	—	45	90	ns
		10	—	23	45	
		15	—	18	35	
Propagation Delay Time	t_{PLH}	5.0	—	75	150	ns
		10	—	35	70	
		15	—	25	50	
	t_{PHL}	5.0	—	75	150	ns
		10	—	35	70	
		15	—	25	50	
Output Disable Time	t_{HZ}	5.0	—	75	150	ns
		10	—	40	80	
		15	—	35	70	
	t_{LZ}	5.0	—	80	160	ns
		10	—	40	80	
		15	—	35	70	
Output Enable Time	t_{ZH}	5.0	—	65	130	ns
		10	—	25	50	
		15	—	20	40	
	t_{ZL}	5.0	—	100	200	ns
		10	—	35	70	
		15	—	25	50	

● t_{HZ} , t_{ZH}

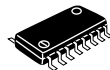


● t_{LZ} , t_{ZL}





Hitachi Code	DP-16
JEDEC	Conforms
EIAJ	Conforms
Weight (reference value)	1.07 g



*Dimension including the plating thickness
Base material dimension

Hitachi Code	FP-16DA
JEDEC	—
EIAJ	Conforms
Weight (reference value)	0.24 g



*Dimension including the plating thickness
Base material dimension

Hitachi Code	FP-16DN
JEDEC	Conforms
EIAJ	Conforms
Weight (reference value)	0.15 g

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