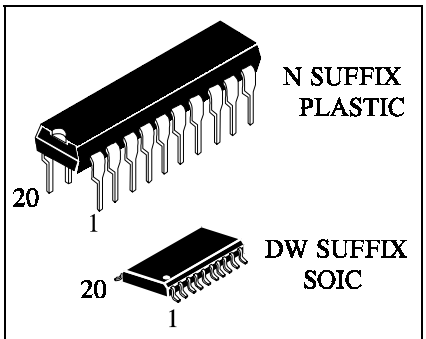
IN74ALS245

Octal 3-State Noninverting Bus Transceiver



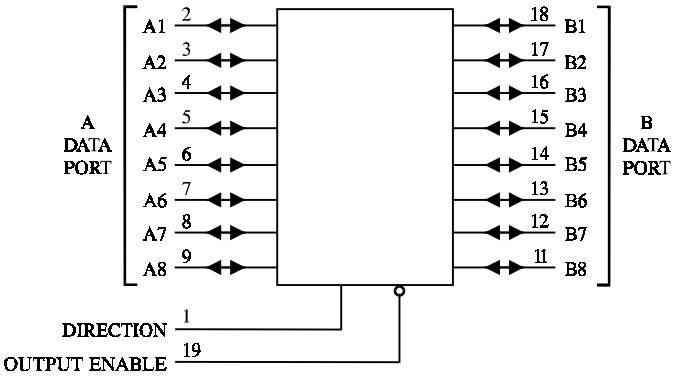
ORDERING INFORMATION
IN74ALS245N Plastic
IN74ALS245DW SOIC
T_A = -10° to 70° C
for all packages

This device contains eight pairs of 3-state logic elements designed for asynchronous two-way communication between data buses.

These circuits are suited for use in memory, microprocessor systems and asynchronous bi-directional data buses. The Enable input ($\overline{E}$) can be used to isolate the buses.

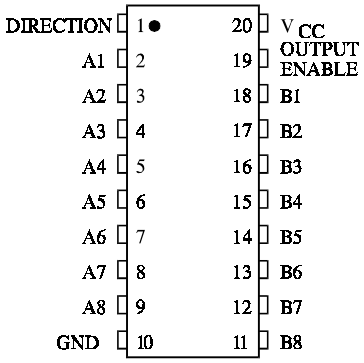
- Non-inverting logic output
- Switching response specified into 500Ω/50 pF
- Switching specifications guaranteed over full temperature and V_{CC} range
- Low level drive current:
  54ALS = 12 mA, 74ALS = 24 mA

LOGIC DIAGRAM



PIN 20=V_{CC}
PIN 10 = GND

PIN ASSIGNMENT



FUNCTION TABLE

Control Inputs		Operation
Output Enable	Direction	
L	L	Data Transmitted from Bus B to Bus A
L	H	Data Transmitted from Bus A to Bus B
H	X	Buses Isolated (High Impedance State)

X = don't care

MAXIMUM RATINGS*

Symbol	Parameter	Value	Unit
V_{CC}	Supply Voltage	7.0	V
V_{IN}	Input Voltage	7.0	V
V_{OUT}	Output Voltage	5.5	V
Tstg	Storage Temperature Range	-65 to +150	°C

*Maximum Ratings are those values beyond which damage to the device may occur.
Functional operation should be restricted to the Recommended Operating Conditions.

RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Min	Max	Unit
V_{CC}	Supply Voltage	4.5	5.5	V
V_{IH}	High Level Input Voltage	2.0		V
V_{IL}	Low Level Input Voltage		0.8	V
I_{OH}	High Level Output Current		-15	mA
I_{OL}	Low Level Output Current		24	mA
T_A	Ambient Temperature Range	-10	+70	°C

DC ELECTRICAL CHARACTERISTICS over full operating conditions

Symbol	Parameter	Test Conditions		Guaranteed Limit		Unit
				Min	Max	
V_{IK}	Input Clamp Voltage	V_{CC} = min, I_{IN} = -18 mA			-1.5	V
V_{OH}	High Level Output Voltage	V_{CC} = min, I_{OH} = -0.4 mA		2.5		V
		V_{CC} = min, I_{OH} = -3.0 mA		2.4		
		V_{CC} = min, I_{OH} = -15 mA		2.0		
V_{OL}	Low Level Output Voltage	V_{CC} = min, I_{OL} = 12 mA			0.4	V
		V_{CC} = min, I_{OL} = 24 mA			0.5	
I_{OZH}	Output Off Current HIGH	V_{CC} = max, V_{OUT} = 2.7 V			20	µA
I_{OZL}	Output Off Current LOW	V_{CC} = max, V_{OUT} = 0.4 V			-20	µA
I_{IH}	High Level Input Current	V_{CC} = max, V_{IN} = 2.7 V			20	µA
		V_{CC} = max, V_{IN} = 5.5 V			0.1	mA
		V_{CC} = max, V_{IN} = 7.0 V for Pin1, Pin 19			0.1	
I_{IL}	Low Level Input Current	V_{CC} = max, V_{IN} = 0.4 V			-0.1	mA
I_O	Output Short Circuit Current	V_{CC} = max, V_O = 2.25 V		-30	-112	mA
I_{CC}	Supply Current	V_{CC} = max	Outputs High		45	mA
			Outputs Low		55	
			3-State (High Z)		58	

AC ELECTRICAL CHARACTERISTICS over full operating conditions (V_{CC} = 5.0 V±10%, C_L = 50 pF, $R_{L1:}$ = R_{L2} = 500Ω, Input t_r = t_f = 2.0 ns)

Symbol	Parameter	Min	Max	Unit
t_{PLH}	Propagation Delay Time, Low-to-High Level Output (from A or B to Output)		10	ns
t_{PHL}	Propagation Delay Time, High-to-Low Level Output (from A or B to Output)		10	ns
t_{PZH}	Output Enable Time to High Level (from OE to Output)		20	ns
t_{PZL}	Output Enable Time to Low Level (from OE to Output)		20	ns
t_{PHZ}	Output Disable Time from High Level (from OE to Output)		40	ns
t_{PLZ}	Output Disable Time from Low Level (from OE to Output)		35	ns

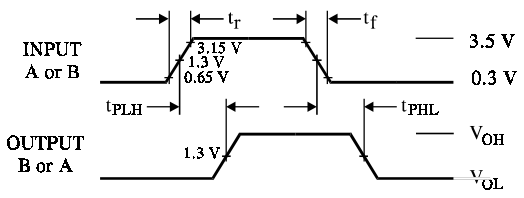
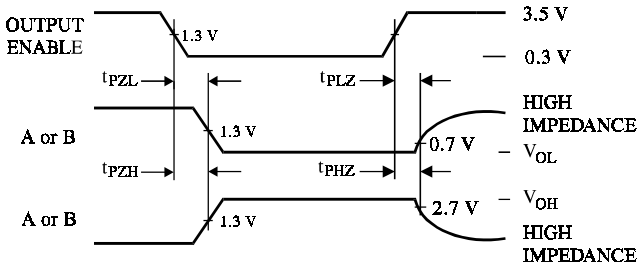
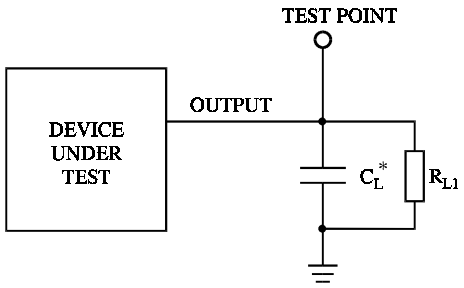


Figure 1. Switching Waveforms



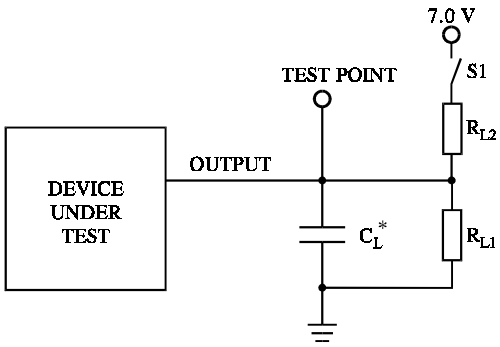
t_{PZL}, t_{PLZ} - S1 closed
t_{PZH}, t_{PHZ} - S1 opened

Figure 2. Switching Waveforms



* Includes all probe and jig capacitance.

Figure 3. Test Circuit



* Includes all probe and jig capacitance.

Figure 4. Test Circuit

EXPANDED LOGIC DIAGRAM