

GD54/74LS245

OCTAL BUS TRANSCEIVER; NON-INVERTED 3-STATE OUTPUTS

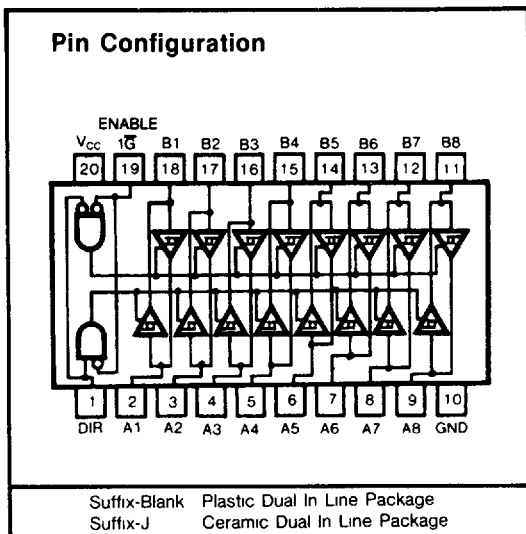
Feature

- Bidirectional Bus Transceiver in a High-Density 20-Pin Package
- 3-State Outputs Drive Bus Lines Directly
- P-N-P Inputs D-C Loading on Bus Lines
- Hysteresis at Bus Inputs Improve Noise Margins
- Typical Propagation Delay Times; Port to Port ... 8 ns

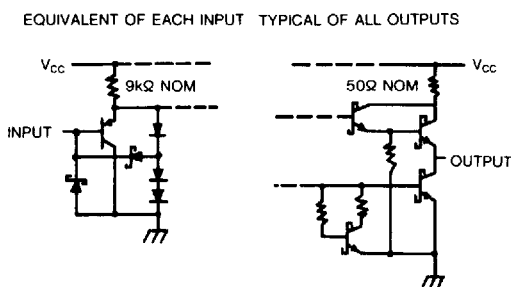
Description

These octal bus transceiver are designed for asynchronous two-way communication between data buses. The control function implementation minimizes external timing requirements.

The device allows data transmission from the A bus to the B bus or from the B bus to the A bus depending upon the logic level at the directional control (DIR) input. The enable input (\bar{G}) can be used to disable the device so that the buses are effectively isolated.



Schematics of Inputs and Outputs



Function Table

ENABLE \bar{G}	DIRECTION CONTROL DIR	OPERATION
L	L	B data to A bus
L	H	A data to B bus
H	X	Isolation

Absolute Maximum Ratings

- Supply voltage, V_{CC} 7V
- Input voltage 7V
- Off-state output voltage 5.5V
- Operating free-air temperature range 54LS -55°C to 125°C
 74LS 0°C to 70°C
- Storage temperature range -65°C to 150°C

Recommended Operating Conditions

SYMBOL	PARAMETER		MIN	NOM	MAX	UNIT
V _{CC}	Supply voltage	54	4.5	5	5.5	V
		74	4.75	5	5.25	
I _{OH}	High-level output current	54			-12	mA
		74			-15	
I _{OL}	Low-level output current	54			12	mA
		74			24	
T _A	Operating free-air temperature	54	-55		125	°C
		74	0		70	

Electrical Characteristics over recommended operating free-air temperature range (unless otherwise noted)

SYMBOL	PARAMETER	TEST CONDITIONS	TYP (Note 1)		MAX	UNIT	
			MIN	MAX			
V _{IH}	High-level input voltage		2			V	
V _{IL}	Low-level input voltage		54		0.7	V	
			74		0.8		
V _{IK}	Input clamp voltage	V _{CC} =Min, I _I =-18mA			-1.5	V	
V _{T+} -V _{T-}	Hysteresis	V _{CC} =Min,	0.2	0.4		V	
V _{OH}	High-level output voltage	V _{CC} =Min, V _{IH} =Min V _{IL} =Max, I _{OH} =-1mA	74	2.7		V	
		V _{CC} =Min, V _{IH} =Min V _{IL} =Max, I _{OH} =-3mA	54,74	2.4	3.4		
		V _{CC} =Min, V _{IH} =Min V _{IL} =0.5V, I _{OH} =Max	54,74	2			
V _{OL}	Low-level output voltage	V _{CC} =Min V _{IL} =Max V _{IH} =Min	I _{OL} =12mA	54, 74	0.25	0.4	V
			I _{OL} =24mA	74	0.35	0.5	
I _{OZH}	Off-state output current high-level voltage applied	V _{CC} =Max, V _O =2.7V V _{IH} =Min, V _{IL} =Max	G̅ at 2V			20	μA
I _{OZL}	Off-state output current low-level voltage applied	V _{CC} =Max, V _O =0.4V V _{IH} =Min, V _{IL} =Max				-200	μA
I _I	Input current at maximum maximum input voltage	A or B DIR or G̅	V _{CC} =Max	V _I =55V V _I =7V		0.1	mA
I _{IH}	High-level input current	V _{CC} =Max, V _I =2.7V				20	μA
I _{IL}	Low-level input current	V _{CC} =Max, V _I =0.4V				-0.2	mA
I _{OS}	Short-circuit output current	V _{CC} =Max (Note 2)			-40	-225	mA
I _{CC}	Supply Current	Outputs high	V _{CC} =5.25V, Outputs open		48	70	mA
		Outputs low			62	90	
		All outputs disabled			64	95	

Note 1: All typical values are at V_{CC}=5V, T_A=25°C

Note 2: Not more than one output should be shorted at a time, and duration of the short-circuit should not exceed one second

Switching Characteristics, $V_{CC} = 5V$, $T_A = 25^\circ C$

SYMBOL	PARAMETER	TEST CONDITION#	MIN	TYP	MAX	UNIT
t_{PLH}	Propagation delay time, low-to-high-level output	$C_L = 45pF, R_L = 667\Omega$	8	12		ns
t_{PHL}	Propagation delay time, high-to-low-level output		8	12		ns
t_{PZL}	Output enable time to low level		27	40		ns
t_{PZH}	Output enable time to high level		25	40		ns
t_{PLZ}	Output disable time from low level	$C_L = 5pF, R_L = 667\Omega$	15	25		ns
t_{PHZ}	Output disable time from high level		15	25		ns

For load circuit and voltage waveforms see page 3-11