GD54/74LS245

OCTAL BUS TRANSCEIVER; NON-INVERTED 3-STATE OUTPUTS

Feature

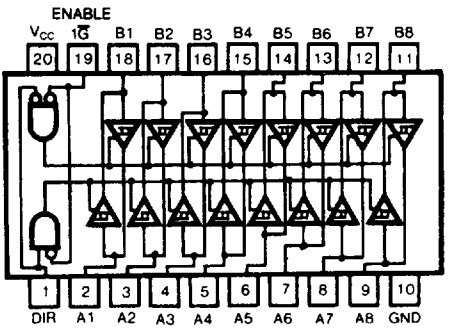
- Bidirectional Bus Transceiver in a High-Density 20-Pin Package
- 3-State Outputs Dirve Bus Lines Directly
- P-N-P Inputs D-C Loading on Bus Lines
- Hysteresis at Bus Inputs Improve Noise Margins
- Typical Propagation Delay Times; Port to Port ... 8 ns

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 ($\overline{G}$) can be used to disable the device so that the buses are effectively isolated.

Pin Configuration

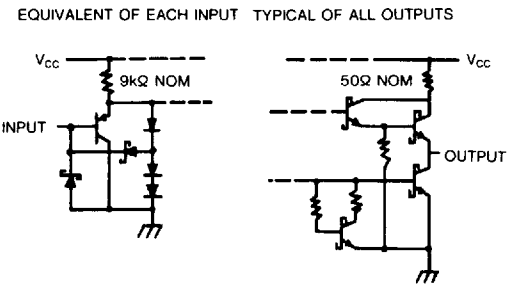


Suffix-Blank Plastic Dual In Line Package
Suffix-J Ceramic Dual In Line Package

Function Table

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

Schematics of Inputs and Outputs



Absolute Maximum Ratings

- Supply voltage, Vcc 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			MIN	TYP (Note 1)	MAX	UNIT
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		$\overline{G}$ 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		$\overline{G}$ at 2V			−200	μA
I_I	Input current at maximum maximum input voltage	A or B	V_{CC}=Max		V_I=5.5V		0.1	mA
		DIR or $\overline{G}$			V_I=7V			
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, $V_{CC}=5V$, $T_A=25°C$

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