

QUADRUPLE 2-TO-1-LINE DATA SELECTORS/MULTIPLEXERS (INVERTED DATA OUTPUTS) **GD54/74LS158**

Features

- Buffered Inputs and Outputs
- Converted outputs provided.

Applications

- Expand Any Data Input Point
- Multiplex Dual Data Buses
- Generate Four Functions of Two Variables (One Variable is Common)
- Source Programmable Counters

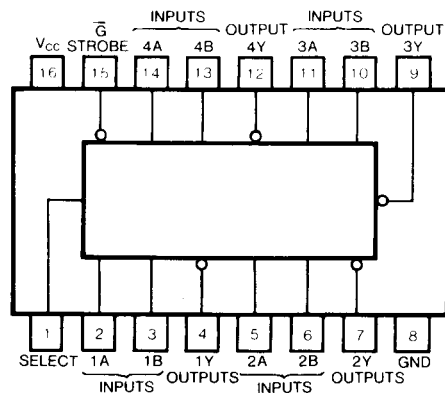
Description

This monolithic data selector/multiplexer contains inverters and drivers to supply full on-chip data selection to the four output gates. A separate strobe input is provided. A 4-bit word is selected from one of two sources and is routed to the four outputs. The LS 158 presents inverted data to minimize propagation delay time.

Function Table

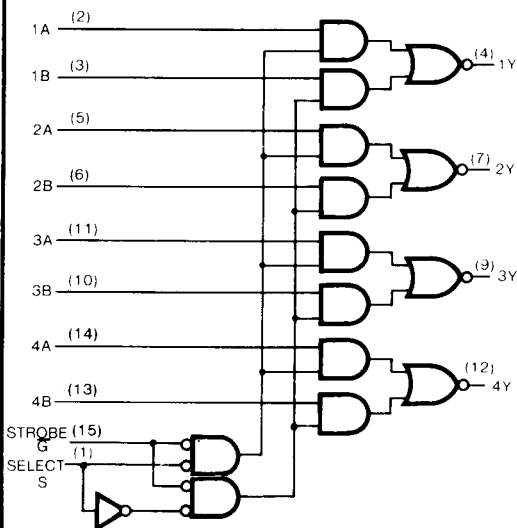
		INPUTS		OUTPUT Y
STROBE	SELECT	A	B	
H	X	X	X	L
L	L	L	X	H
L	L	H	X	L
L	H	X	L	H
L	H	X	H	L

Pin Configuration



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

Function Block Diagram



Absolute Maximum Ratings

- Supply voltage, V_{CC} 7V
- Input voltage 7V
- 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	54,74			-400	μA
I_{OL}	Low-level output current	54			4	mA
		74			8	
T_A	Operating free-air temperature	54	-55		125	$^{\circ}\text{C}$
		74	0		70	

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

SYMBOL	PARAMETER	TEST CONDITION	MIN	TYP	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	$V_{CC}=\text{Min}, I_I=-12\text{mA}$			-1.5	V
V_{OH}	High-level output voltage	$V_{CC}=\text{Min}, V_{IH}=\text{Min}$	54	2.5	3.4	μA
		$V_{IL}=\text{Max}, I_{OH}=\text{Max}$	74	2.7	3.4	
V_{OL}	Low-level output voltage	$V_{CC}=\text{Min}, I_{OL}=4\text{mA}$	54,74	0.25	0.4	V
		$V_{IL}=\text{Max}, V_{IH}=\text{Min}, I_{OL}=8\text{mA}$	54	0.35	0.5	
I_I	Input current at maximum input voltage	$V_{CC}=\text{Max}, V_I=7\text{V}$	S or G input		0.2	mA
			A or B input		0.1	
I_{IH}	High-level input current	$V_{CC}=\text{Max}, V_I=2.7\text{V}$	S or G input		40	μA
			A or B input		20	
I_{IL}	Low-level input current	$V_{CC}=\text{Max}, V_I=0.4\text{V}$	S or G input		-0.8	mA
			A or B input		-0.4	
I_{OS}	Short-circuit output current	$V_{CC}=\text{Max}$ (Note 2)	-20		-100	mA
I_{CC}	Supply current	$V_{CC}=\text{Max}$ (Note 3)		4.8	8	mA
		$V_{CC}=\text{Max}$ (Note 4)		6.5	11	

Note 1: All typical values are at $V_{CC}=5\text{V}$, $T_A=25^{\circ}\text{C}$.

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

Note 3: I_{CC} is measured with all outputs open, and all inputs at 4.5V

Note 4: I_{CC} is measured with all A inputs at 4.5V and all other inputs at 0V.

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

PARAMETER*	FROM (INPUT)	TEST CONDITION#	MIN	TYP	MAX	UNIT
t_{PLH}	Data	$C_L=15\text{pF}$ $R_L=2\text{k}\Omega$		7	14	ns
t_{PHL}				10	14	
t_{PLH}	Strobe			11	20	ns
t_{PHL}				18	21	
t_{PLH}	Select			13	23	ns
t_{PHL}				16	27	

* t_{PLH} = propagation delay time, low-to-high-level output.

* t_{PHL} = propagation delay time, high-to-low-level output.

For load circuit and voltage waveforms, see page 3-11.

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