

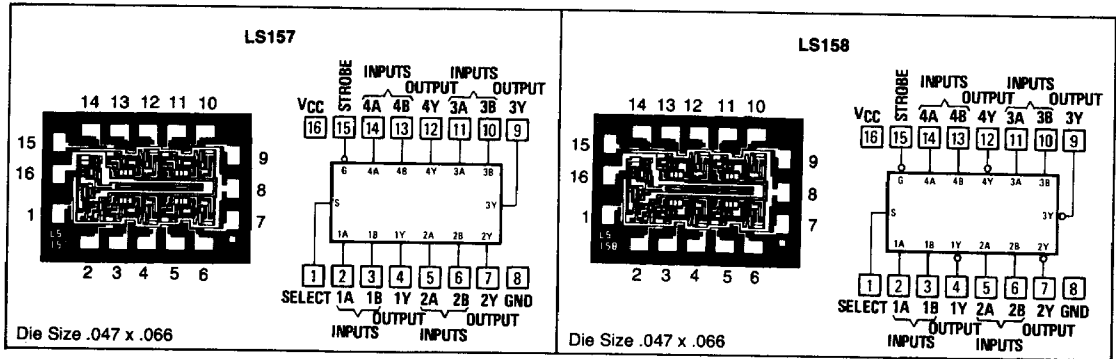
Quadruple 2-Line-To-1 Line Multiplexers

LS157 LS158

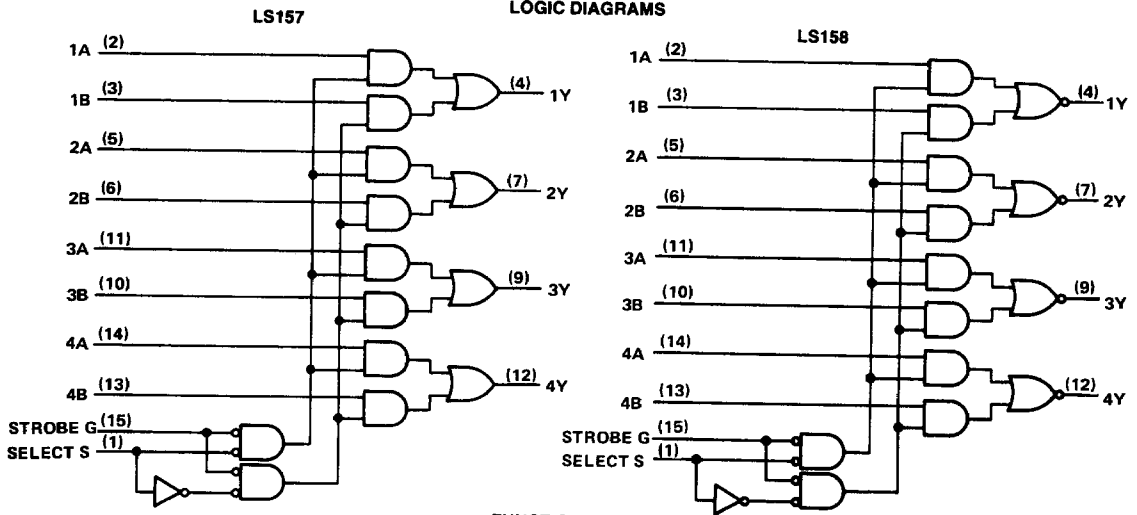
DESCRIPTION

These data selectors/multiplexers select a 4-bit word from one of two sources and present it at the four outputs. The LS157 presents true data; the LS158 presents inverted data.

PIN-OUT DIAGRAMS



LOGIC DIAGRAMS



FUNCTION TABLE

STROBE	INPUTS			OUTPUT Y	
	SELECT	A	B	54LS157	54LS158
H	X	X	X	L	H
L	L	L	X	L	H
L	L	H	X	H	L
L	H	X	L	L	H
L	H	X	H	H	L

H = high level, L = low level, X = don't care

Low level at S selects A inputs

High level at S selects B inputs

Strobe is active low

Recommended Operating Conditions

	9LS/54LS			9LS/74LS			Unit
	Min	Nom	Max	Min	Nom	Max	
Supply voltage, V_{CC}	4.5	5	5.5	4.75	5	5.25	V
High-level output current, I_{OH}			-400			-400	μ A
Low-level output current, I_{OL}			4			8	mA
Operating free-air temperature, T_A	-55		125	0		70	$^{\circ}$ C

Electrical Characteristics Over Recommended Free-Air Temperature Range (Unless Otherwise Noted)

Parameter	Test Conditions*	9LS/54LS			9LS/74LS			Unit
		Min	Typ**	Max	Min	Typ**	Max	
V_{IH}		2			2			V
V_{IL}				0.7			0.8	V
V_I	$V_{CC}=\text{MIN}, I_I=-18\text{mA}$			-1.5			-1.5	V
V_{OH}	$V_{CC}=\text{MIN}, V_{IH}=2\text{V}, V_{IL}=\text{MAX}, I_{OH}=-400\mu\text{A}$	2.5	3.4		2.7	3.4		V
V_{OL}	$V_{CC}=\text{MIN}, V_{IH}=2\text{V}, V_{IL}=\text{MAX}$	$I_{OL}=4\text{mA}$	0.25	0.4		0.25	0.4	V
		$I_{OL}=8\text{mA}$				0.35	0.5	
I_I	S or G input	$V_{CC}=\text{MAX}, V_I=7\text{V}$		0.2		0.2	mA	
	A or B input			0.1		0.1		
I_{IH}	S or G input	$V_{CC}=\text{MAX}, V_I=2.7\text{V}$		40		40	μ A	
	A or B input			20		20		
I_{IL}	S or G input	$V_{CC}=\text{MAX}, V_I=0.4\text{V}$		-0.8		-0.8	mA	
	A or B input			-0.4		-0.4		
I_{OS}^{\dagger}	$V_{CC}=\text{MAX}$	-15		-100	-15		-100	mA
$I_{CC}^{\dagger\dagger}$	$V_{CC}=\text{MAX},$	LS157	9.7	16		9.7	16	mA
		LS158	4.8	8		4.8	8	

*For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable device type.

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

\dagger Not more than one output should be shorted at a time.

$\dagger\dagger I_{CC}$ is measured with 4.5V applied to all inputs and all output open.

Quadruple 2-Line-To-1 Line Multiplexers

LS157 LS158

Switching Characteristics, $V_{CC} = 5V$ Over Recommended Free-Air Temperature Range

Parameter	From (input)	To (output)	-55°C			+25°C			+125°C			Unit	
			Min	Typ	Max	Min	Typ	Max	Min	Typ	Max		
Test Conditions: $C_L = 15pF$, $R_L = 2k\Omega$ (See Fig. A, page 2-174)													
t_{PLH}	LS157	Data	Y		6	11		5	10		9	16	ns
t_{PHL}				8	13		7	12		7	13		
t_{PLH}	LS158	Data	Y		6	11		6	11		8	14	ns
t_{PHL}				7	12		4	9		4	8		
t_{PLH}	LS157	Strobe	Y		10	16		10	16		16	22	ns
t_{PHL}				12	17		9	14		9	14		
t_{PLH}	LS158	Strobe	Y		10	16		9	14		10	15	ns
t_{PHL}				10	15		10	15		12	17		
t_{PLH}	LS157	Select	Y		11	17		11	17		16	24	ns
t_{PHL}				13	18		11	16		12	19		
t_{PLH}	LS158	Select	Y		10	16		10	16		13	20	ns
t_{PHL}				10	16		10	14		12	17		
Test Conditions: $C_L = 50pF$, $R_L = 2k\Omega$ (See Fig. A, page 2-174)													
t_{PLH}	LS157	Data	Y		8	14		7	14		10	17	ns
t_{PHL}				11	16		9	15		10	16		
t_{PLH}	LS158	Data	Y		7	13		8	13		10	16	ns
t_{PHL}				10	16		7	13		7	12		
t_{PLH}	LS157	Strobe	Y		12	17		12	17		18	25	ns
t_{PHL}				15	20		12	17		13	18		
t_{PLH}	LS158	Strobe	Y		12	17		11	16		12	17	ns
t_{PHL}				14	19		13	18		15	21		
t_{PLH}	LS157	Select	Y		12	18		13	18		16	21	ns
t_{PHL}				15	21		14	19		14	20		
t_{PLH}	LS158	Select	Y		12	18		12	18		15	22	ns
t_{PHL}				14	19		13	18		15	21		

Note: AC specification shown under -55°C and +125°C are for 9LS devices only. All 50pF specifications are for 9LS only.