



U74HC157

CMOS IC

QUADRUPLE 2-LINE TO 1-LINE DATA SELECTORS / MULTIPLEXERS

DESCRIPTION

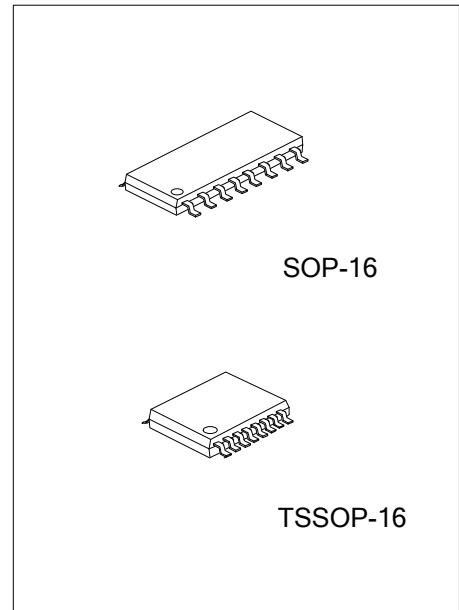
The **U74HC157** is a quadruple 2-line to 1-line data selectors/multiplexers. When \bar{G} is high all outputs are low. When \bar{G} is low a 4-bit word is selected from one of two sources and is routed to the four outputs. The device provides true data.

FEATURES

- * Wide supply voltage range from 2V to 6V
- * Typical t_{PD} at 11ns from A or B to Y at 6V, $C_L=50pF$
- * Low power consumption, $I_{CC} = 8 \mu A$ (MAX) at 6V
- * ± 6 mA output driver at 5V
- * Low Input Current of 0.1uA Max

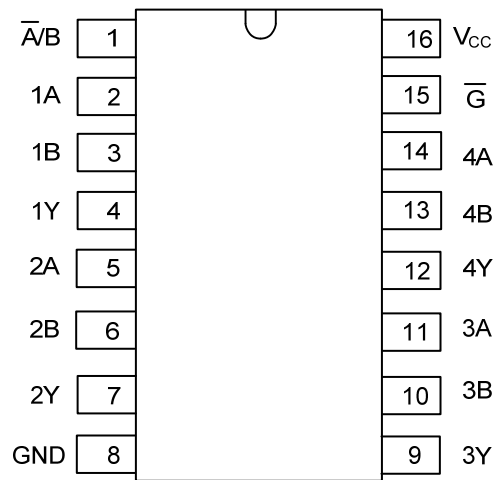
ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74HC157L-S16-R	U74HC157G-S16-R	SOP-16	Tape Reel
U74HC157L-S16-T	U74HC157G-S16-T	SOP-16	Tube
U74HC157L-P16-R	U74HC157G-P16-R	TSSOP-16	Tape Reel
U74HC157L-P16-T	U74HC157G-P16-T	TSSOP-16	Tube



<p>U74HC157L-S16-R</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Lead Free</p>	<p>(1) R: Tape Reel, T: Tube</p> <p>(2) S16: SOP-16, P16: TSSOP-16</p> <p>(3) G: Halogen Free, L: Lead Free</p>
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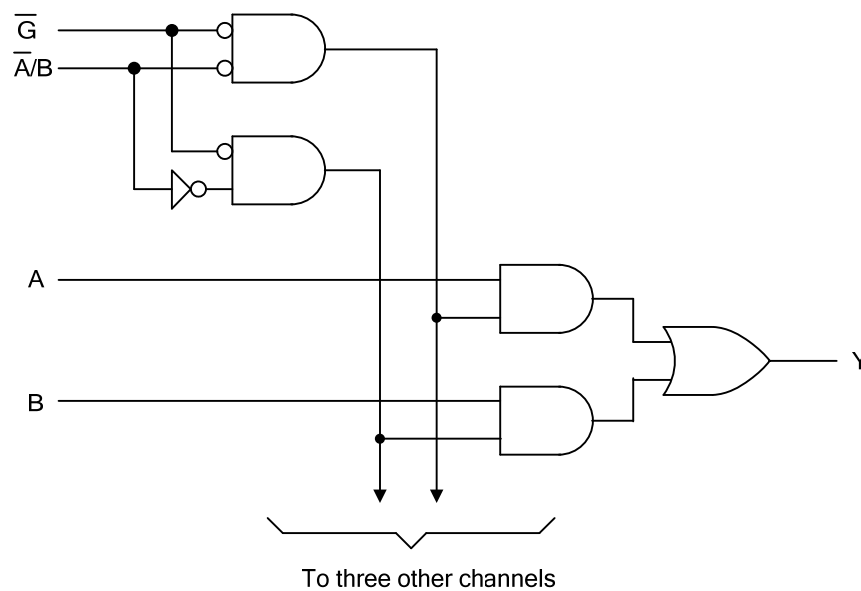
■ PIN CONFIGURATION



■ FUNCTION TABLE

INPUTS				OUTPUTS
\bar{G}	\bar{A}/B	A	B	Y
H	X	X	X	L
L	L	L	X	L
L	L	H	X	H
L	H	X	L	L
L	H	X	H	H

■ LOGIC DIAGRAM



■ ABSOLUTE MAXIMUM RATING ($T_A = 25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage Range	V_{CC}	-0.5~7	V
Input Clamp Current ($V_{IN} < 0$)	I_{IK}	± 20	mA
Output Clamp Current ($V_{OUT} < 0$, or $V_{OUT} > V_{CC}$)	I_{OK}	± 20	mA
Output Current	I_{OUT}	± 35	mA
V_{CC} or GND Current	I_{CC}	± 70	mA
Storage Temperature	T_{STG}	-65 ~ +150	$^\circ\text{C}$

Note: 1. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

2. Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}		2	5	6	V
High-Level Input Voltage	V_{IH}	$V_{CC}=2\text{V}$	1.5			V
		$V_{CC}=4.5\text{V}$	3.15			
		$V_{CC}=6\text{V}$	4.2			
Low-Level Input Voltage	V_{IL}	$V_{CC}=2\text{V}$			0.5	V
		$V_{CC}=4.5\text{V}$			1.35	
		$V_{CC}=6\text{V}$			1.8	
Input Voltage	V_{IN}		0		V_{CC}	V
Output Voltage	V_{OUT}		0		V_{CC}	V
Input Transition Rise or Fall Rate	$\Delta t/\Delta V$	$V_{CC}=2\text{V}$			1000	ns/V
		$V_{CC}=4.5\text{V}$			500	
		$V_{CC}=6\text{V}$			400	
Operating Temperature	T_A		-40		85	$^\circ\text{C}$

■ ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-Level Output Voltage	V_{OH}	$I_{OH} = -20 \mu\text{A}$, $V_{CC} = 2\text{V}$	1.9	1.998		V
		$I_{OH} = -20 \mu\text{A}$, $V_{CC} = 4.5\text{V}$	4.4	4.499		
		$I_{OH} = -20 \mu\text{A}$, $V_{CC} = 6\text{V}$	5.9	5.999		
		$I_{OH} = -6 \text{mA}$, $V_{CC} = 4.5\text{V}$	3.98	4.3		
		$I_{OH} = -7.8 \text{mA}$, $V_{CC} = 6\text{V}$	5.48	5.8		
Low-Level Output Voltage	V_{OL}	$I_{OH} = 20 \mu\text{A}$, $V_{CC} = 2\text{V}$		0.002	0.1	V
		$I_{OH} = 20 \mu\text{A}$, $V_{CC} = 4.5\text{V}$		0.001	0.1	
		$I_{OH} = 20 \mu\text{A}$, $V_{CC} = 6\text{V}$		0.001	0.1	
		$I_{OH} = 6 \text{mA}$, $V_{CC} = 4.5\text{V}$		0.17	0.26	
		$I_{OH} = 7.8 \text{mA}$, $V_{CC} = 6\text{V}$		0.15	0.26	
Input Leakage Current	$I_{I(LEAK)}$	$V_{IN} = V_{CC}$ or GND, $V_{CC} = 6\text{V}$		± 0.1	± 100	nA
Quiescent Supply Current	I_{CC}	$V_{IN} = V_{CC}$ or GND, $I_{OUT} = 0$, $V_{CC} = 6\text{V}$			8	μA
Input Capacitance	C_{IN}	$V_{CC} = 6\text{V}$		3	10	pF

SWITCHING CHARACTERISTICS

See Fig. 1 and Fig. 2 for test circuit and waveforms.

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from input A or B to output Y, t_{pd}	t_{pd}	$V_{CC}=2V, C_L=50pF$		63	125	ns
		$V_{CC}=2V, C_L=150pF$		81	190	
		$V_{CC}=4.5V, C_L=50pF$		13	25	
		$V_{CC}=4.5V, C_L=150pF$		23	38	
		$V_{CC}=6V, C_L=50pF$		11	21	
		$V_{CC}=6V, C_L=150pF$		18	33	
Propagation delay from input \bar{A} / B to output Y, t_{pd}	t_{pd}	$V_{CC}=2V, C_L=50pF$		67	125	ns
		$V_{CC}=2V, C_L=150pF$		81	210	
		$V_{CC}=4.5V, C_L=50pF$		18	25	
		$V_{CC}=4.5V, C_L=150pF$		23	42	
		$V_{CC}=6V, C_L=50pF$		14	21	
		$V_{CC}=6V, C_L=150pF$		18	36	
Propagation delay from input \bar{G} to output Y, t_{pd}	t_{pd}	$V_{CC}=2V, C_L=50pF$		59	115	ns
		$V_{CC}=2V, C_L=150pF$		91	190	
		$V_{CC}=4.5V, C_L=50pF$		16	23	
		$V_{CC}=4.5V, C_L=150pF$		24	38	
		$V_{CC}=6V, C_L=50pF$		13	20	
		$V_{CC}=6V, C_L=150pF$		18	33	
Output Transition Time	t_T	$V_{CC}=2V, C_L=50pF$		28	60	ns
		$V_{CC}=2V, C_L=150pF$		45	210	
		$V_{CC}=4.5V, C_L=50pF$		8	12	
		$V_{CC}=4.5V, C_L=150pF$		17	42	
		$V_{CC}=6V, C_L=50pF$		6	10	
		$V_{CC}=6V, C_L=150pF$		13	36	

Note: t_{PLH} and t_{PHL} is the same as t_{pd}

OPERATING CHARACTERISTICS ($T_A = 25^\circ C$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power dissipation capacitance	C_{PD}	No load		40		pF

■ TEST CIRCUIT AND WAVEFORMS

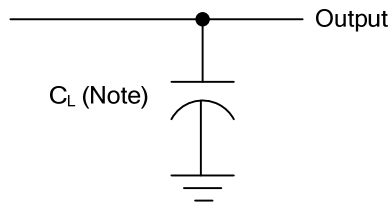
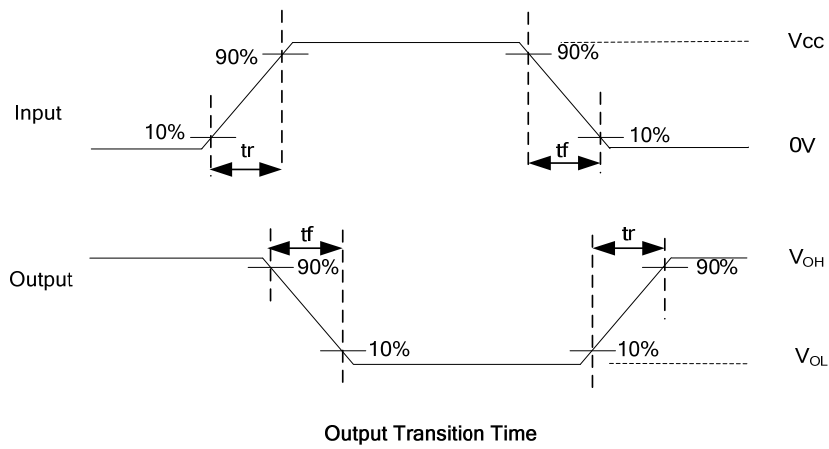
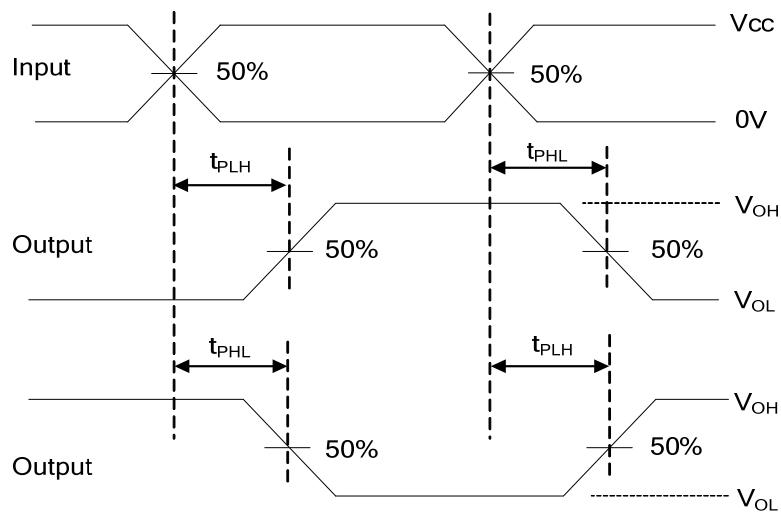


Fig. 1 Load circuitry for switching times.



Output Transition Time



Voltage Waveforms Propagation Delay Times

Fig. 2 Propagation delay from input to output and Output transition time.

Notes: 1. C_L includes probe and jig capacitance.

2. All input pulses are supplied by generators having the following characteristics: $PRR \leq 1\text{MHz}$, $Z_0 = 50\Omega$, $t_r = 6\text{ns}$, $t_f = 6\text{ns}$.

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