



## U74HC157

CMOS IC

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

#### DESCRIPTION

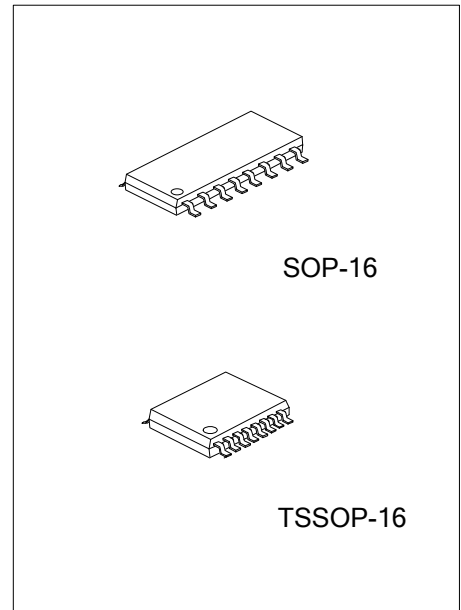
The **U74HC157** is a quadruple 2-line to 1-line data selectors/multiplexers. When  $\bar{G}$  is high all outputs are low. When  $\bar{G}$  is low a 4-bit word is selected from one of two sources and is routed to the four outputs. The device provides true data.

#### 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
- \*  $\pm 6$  mA output driver at 5V
- \* Low Input Current of 0.1uA Max

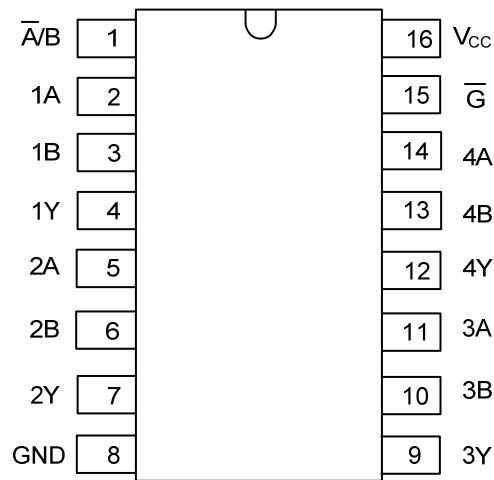
#### ORDERING INFORMATION

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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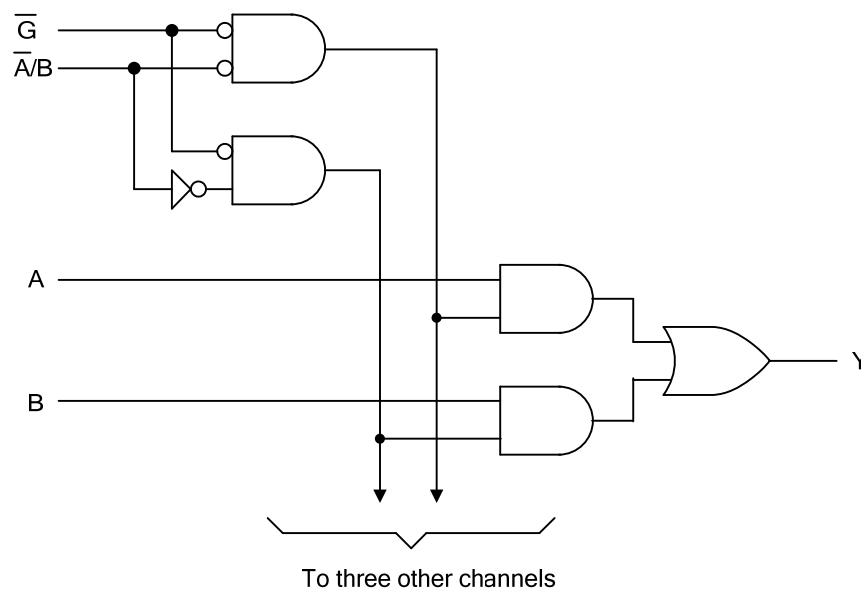
■ PIN CONFIGURATION



■ 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 ( $V_{IN} < 0$ )	$I_{IK}$	$\pm 20$	mA
Output Clamp Current ( $V_{OUT} < 0$ , or $V_{OUT} > V_{CC}$ )	$I_{OK}$	$\pm 20$	mA
Output Current	$I_{OUT}$	$\pm 35$	mA
$V_{CC}$ or GND Current	$I_{CC}$	$\pm 70$	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, $V_{CC} = 6\text{V}$		$\pm 0.1$	$\pm 100$	nA
Quiescent Supply Current	$I_{CC}$	$V_{IN} = V_{CC}$ or GND, $I_{OUT} = 0$ , $V_{CC} = 6\text{V}$			8	$\mu\text{A}$
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

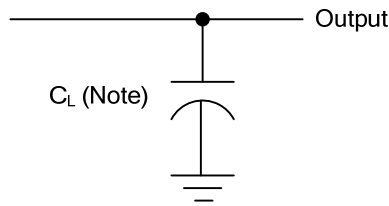
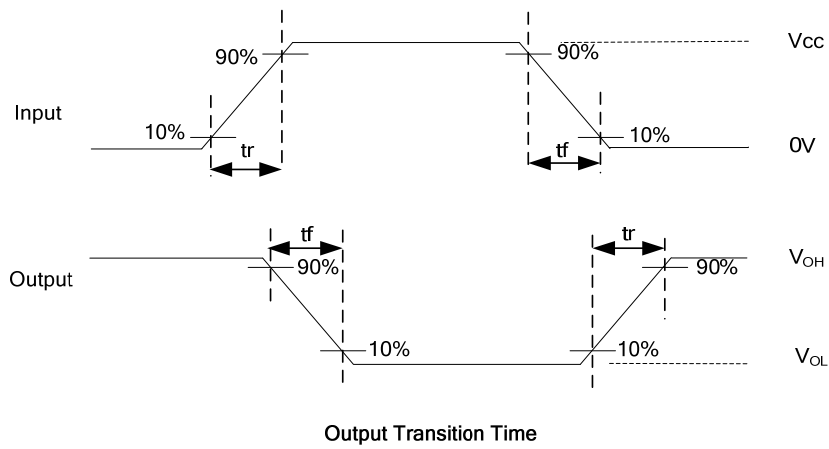
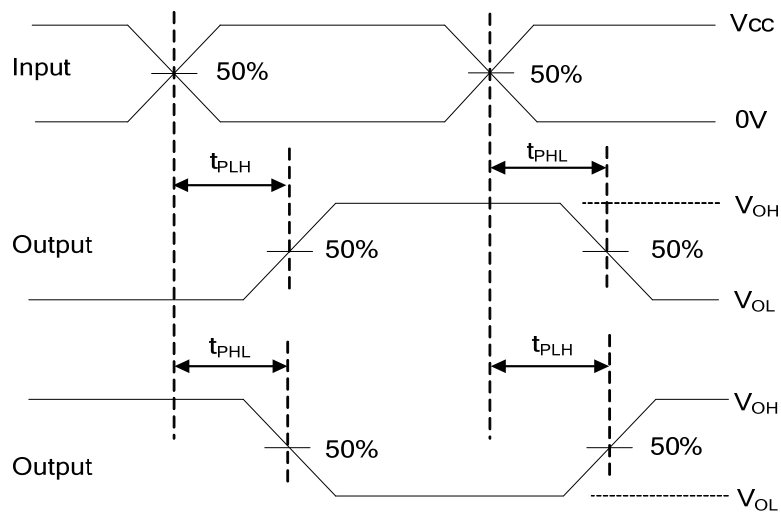


Fig. 1 Load circuitry for switching times.



Output Transition Time



Voltage Waveforms Propagation Delay Times

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

- Notes: 1. C<sub>L</sub> includes probe and jig capacitance.  
 2. All input pulses are supplied by generators having the following characteristics: PRR ≤ 1MHz, Z<sub>0</sub> = 50Ω, t<sub>r</sub> = 6ns, t<sub>f</sub> = 6ns.

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