

# U74LVC157

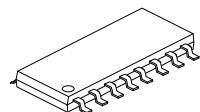
CMOS IC

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

### ■ DESCRIPTION

The **U74LVC157** is designed for 1.65V to 3.6V  $V_{CC}$  operation.

The device features a common strobe ( $\bar{G}$ ) input. 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.



SOP-16

### ■ FEATURES

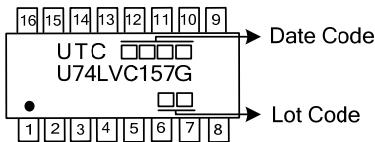
- \* Operate From 1.65V to 3.6V
- \* Inputs Accept Voltages to 5.5V
- \* Max  $t_{pd}$  of 5.2ns at 3.3V
- \* Typical  $V_{OLP}$  (Output Ground Bounce)<0.8V at  $V_{CC}=3.3V$ ,  $T_A=25^\circ C$
- \* Typical  $V_{OHV}$  (Output  $V_{OH}$  Undershoot)>2V at  $V_{CC}=3.3V$ ,  $T_A=25^\circ C$

### ■ ORDERING INFORMATION

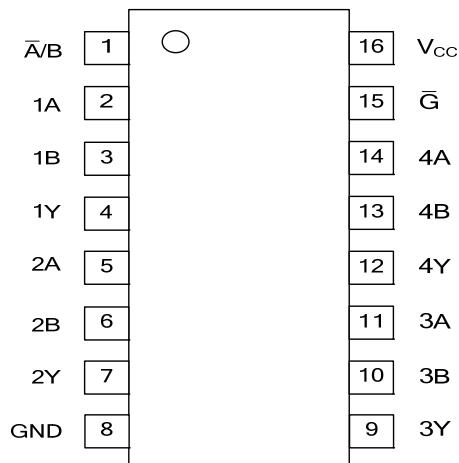
Ordering Number	Package	Packing
U74LVC157G-S16-R	SOP-16	Tape Reel

U74LVC157G-S16-R	(1) Packing Type (2) Package Type (3) Green Package	(1) R: Tape Reel (2) S16: SOP-16 (3) G: Halogen Free and Lead Free
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### ■ MARKING



## ■ PIN CONFIGURATION

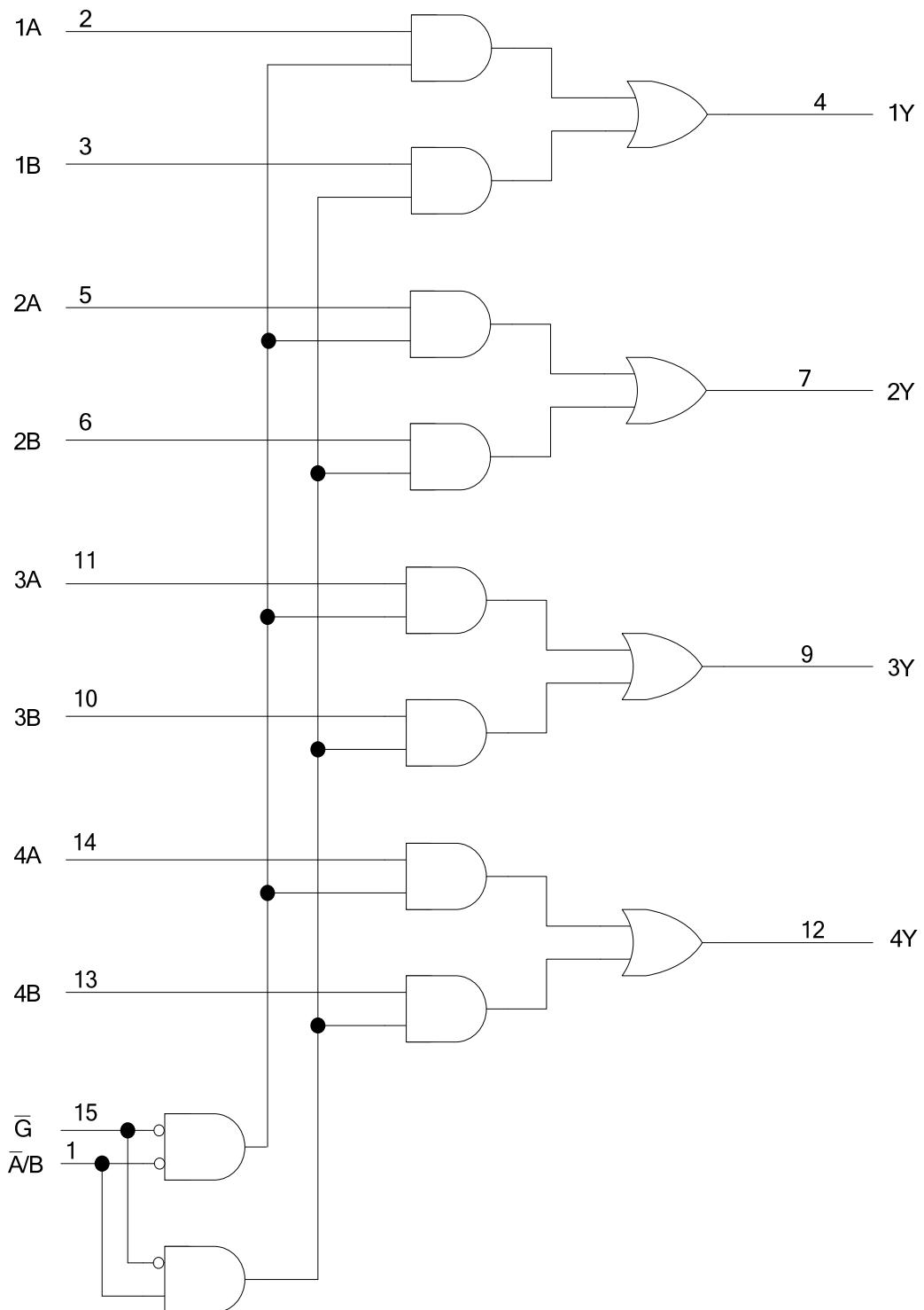


## ■ FUNCTION TABLE

INPUTS				OUTPUT Y
$\bar{G}$	$\bar{A}/B$	A	B	
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

Note: H: HIGH voltage level; L: LOW voltage level; X: Don't care.

■ LOGIC DIAGRAM (positive logic)



### ■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	$V_{CC}$	-0.5 ~ +6.5	V
Input Voltage	$V_{IN}$	-0.5 ~ +6.5	V
Output Voltage	$V_{OUT}$	-0.5 ~ $V_{CC}+0.5$	V
$V_{CC}$ or GND Current	$I_{CC}$	$\pm 100$	mA
Continuous Output Current	$I_{OUT}$	$\pm 50$	mA
Input Clamp Current ( $V_{IN}<0$ )	$I_{IK}$	-50	mA
Output Clamp Current ( $V_{OUT}<0$ )	$I_{OK}$	-50	mA
Storage Temperature Range	$T_{STG}$	-65 ~ +150	°C

Note: 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 ( $T_A = 25^\circ C$ , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	$V_{CC}$	Operating	1.65		3.6	V
Input Voltage	$V_{IN}$		0		5.5	V
Output Voltage	$V_{OUT}$		0		$V_{CC}$	V
High-level input voltage	$V_{IH}$	$V_{CC}=1.65V \sim 1.95V$	$0.65 \times V_{CC}$			V
		$V_{CC}=2.3V \sim 2.7V$	1.7			
		$V_{CC}=2.7V \sim 3.6V$	2			
Low-level input voltage	$V_{IL}$	$V_{CC}=1.65V \sim 1.95V$			$0.35 \times V_{CC}$	V
		$V_{CC}=2.3V \sim 2.7V$			0.7	
		$V_{CC}=2.7V \sim 3.6V$			0.8	
Input Transition Rise or Fall Rate	$\Delta t/\Delta v$				10	ns/V
Operating Temperature	$T_A$		-40		85	°C

3Note: All unused inputs of the device must be held at  $V_{CC}$  or GND to ensure proper device operation.

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-Level Output Voltage	$V_{OH}$	$V_{CC}=1.65 \sim 3.6V$ , $I_{OH}=-100\mu A$	$V_{CC}-0.2$			V
		$V_{CC}=1.65V$ , $I_{OH}=-4mA$	1.29			
		$V_{CC}=2.3V$ , $I_{OH}=-8mA$	1.9			
		$V_{CC}=2.7V$ , $I_{OH}=-12mA$	2.2			
		$V_{CC}=3.0V$ , $I_{OH}=-12mA$	2.4			
		$V_{CC}=3V$ , $I_{OH}=-24mA$	2.3			
Low-Level Output Voltage	$V_{OL}$	$V_{CC}=1.6 \sim 3.6V$ , $I_{OL}=100\mu A$			0.1	V
		$V_{CC}=1.65V$ , $I_{OL}=4mA$			0.24	
		$V_{CC}=2.3V$ , $I_{OL}=8mA$			0.30	
		$V_{CC}=2.7V$ , $I_{OL}=12mA$			0.40	
		$V_{CC}=3V$ , $I_{OL}=24mA$			0.55	
Input Leakage Current	$I_{I(LEAK)}$	$V_{CC}=3.6V$ , $V_{IN}=5.5V$ or GND			$\pm 1$	μA
Quiescent Supply Current	$I_{CC}$	$V_{IN}=V_{CC}$ or GND, $I_{OUT}=0$ $V_{CC}=3.6V$			1	μA
Additional Quiescent Supply Current Per Input Pin	$\Delta I_{CC}$	$V_{CC}=2.7V \sim 3.6V$ , One input at $V_{CC}-0.6V$ , Other inputs at $V_{CC}$ or GND			500	μA
Input Capacitance	$C_I$	$V_{CC}=3.3V$ , $V_{IN}=V_{CC}$ or GND			5	pF

■ SWITCHING CHARACTERISTICS ( $T_A = 25^\circ C$ , unless otherwise specified)(see Figure 1)

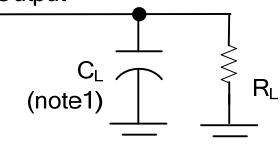
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from input (A or B) to output(Y)	$t_{PLH}/t_{PHL}$	$V_{CC}=1.8V \pm 0.15V, C_L=30pF$	1	5.5	13.5	ns
		$V_{CC}=2.5V \pm 0.2V, C_L=30pF$	1	3.2	7.4	
		$V_{CC}=2.7V, C_L=50pF$	1	3.6	5.7	
		$V_{CC}=3.3V \pm 0.3V, C_L=50pF$	1	3	5	
Propagation delay from input (A/B) to output(Y)	$t_{PLH}/t_{PHL}$	$V_{CC}=1.8V \pm 0.15V, C_L=30pF$	1	6	15.5	ns
		$V_{CC}=2.5V \pm 0.2V, C_L=30pF$	1	3.7	9.6	
		$V_{CC}=2.7V, C_L=50pF$	1	4.1	7.9	
		$V_{CC}=3.3V \pm 0.3V, C_L=50pF$	1	3.4	6.6	
Propagation delay from input ( $\bar{G}$ ) to output(Y)	$t_{PLH}/t_{PHL}$	$V_{CC}=1.8V \pm 0.15V, C_L=30pF$	1	5.9	13.5	ns
		$V_{CC}=2.5V \pm 0.2V, C_L=30pF$	1	3.5	9.3	
		$V_{CC}=2.7V, C_L=50pF$	1	3.9	7.6	
		$V_{CC}=3.3V \pm 0.3V, C_L=50pF$	1	3.3	6.3	

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	$C_{PD}$	$f=10MHz$	$V_{CC}=1.8V$		14	pF
			$V_{CC}=2.5V$		15	
			$V_{CC}=3.3V$		16	

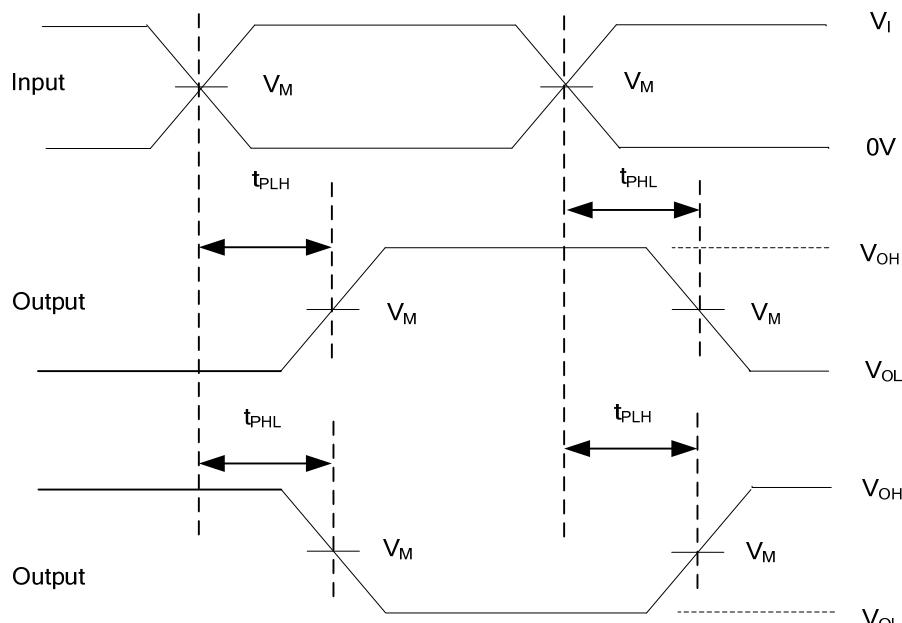
■ TEST CIRCUIT AND WAVEFORMS

From Output



TEST CIRCUIT

$V_{CC}$	INPUTS		$V_M$	$C_L$	$R_L$
	$V_I$	$t_r / t_f$			
$1.8V \pm 0.15V$	$V_{CC}$	$\leq 2\text{ns}$	$V_{CC}/2$	30pF	$1K\Omega$
$2.5V \pm 0.2V$	$V_{CC}$	$\leq 2\text{ns}$	$V_{CC}/2$	30pF	$500\Omega$
2.7V	2.7V	$\leq 2.5\text{ns}$	1.5V	50pF	$500\Omega$
$3.3V \pm 0.3V$	2.7V	$\leq 2.5\text{ns}$	1.5V	50pF	$500\Omega$



PROPAGATION DELAY TIMES

- Note: 1.  $C_L$  includes probe and jig capacitance.  
2. All input pulses are supplied by generators having the following characteristics: PRR  $\leq 10\text{MHz}$ ,  $Z_0=50\Omega$ .

Figure 1. Test Circuit and Voltage Waveforms

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