



## U74LVC1G157

CMOS IC

### SINGLE 2-INPUT MULTIPLEXER

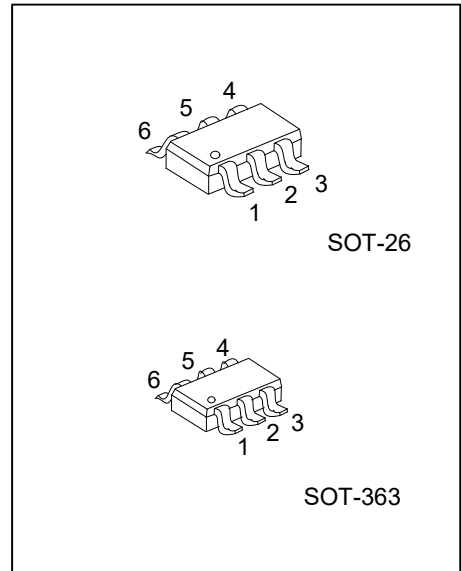
#### DESCRIPTION

The **U74LVC1G157** is a single 2-input multiplexer. The data select input(S) determines the two data input I0 or I1 which of them is connect to the output with the true and complementary data.

This device has power-down protective circuit, preventing device destruction when it is powered down.

#### FEATURES

- \* Wide supply voltage range from 1.65V to 5.5V
- \* I<sub>OFF</sub> supports partial-power-down mode
- \* Low static power consumption; I<sub>CC</sub>=10μA (Max.)
- \* ±24mA output drive (V<sub>CC</sub>=3.0V)

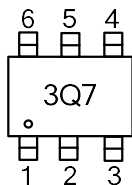


#### ORDERING INFORMATION

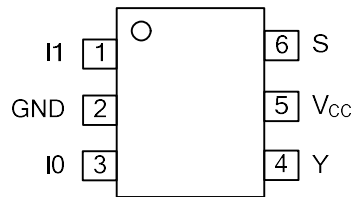
Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74LVC1G157L-AG6-R	U74LVC1G157G-AG6-R	SOT-26	Tape Reel
U74LVC1G157L-AL6-R	U74LVC1G157G-AL6-R	SOT-363	Tape Reel

<p>U74LVC1G157G-AG6-R</p>	<p>(1) R: Tape Reel</p> <p>(2) AG6: SOT-26, AL6: SOT-363</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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#### MARKING



## ■ PIN CONFIGURATION

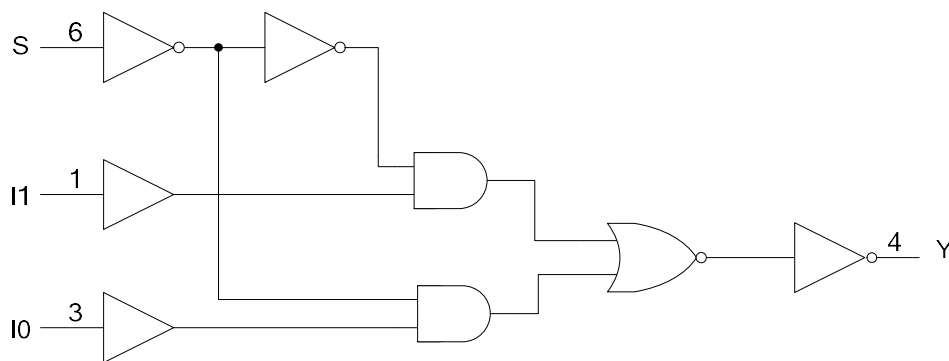


## ■ FUNCTION TABLE

INPUTS			OUTPUT
S	I1	I0	Y
L	X	L	L
L	X	H	H
H	L	X	L
H	H	X	H

Note: H: High voltage level; L: Low voltage level; X: Don't care

## ■ LOGIC DIAGRAM



Logic symbol

## ■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	CONDITIONS	RATINGS	UNIT
Supply Voltage	$V_{CC}$		-0.5 ~ +6.5	V
Input Voltage	$V_{IN}$		-0.5 ~ +6.5	V
Output Voltage	$V_{OUT}$	Output in the power-off state	-0.5 ~ +6.5	V
		Output in the high or low state	-0.5 ~ $V_{CC}+0.5$	V
Continuous $V_{CC}$ or GND Current	$I_{CC}$		±100	mA
Continuous Output Current	$I_{OUT}$	$V_{OUT}=0V \sim V_{CC}$	±50	mA
Input Clamp Current	$I_{IK}$	$V_{IN}<0V$	-50	mA
Output Clamp Current	$I_{OK}$	$V_{OUT}>V_{CC}$ or $V_{OUT}<0V$	±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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	$V_{CC}$	Operating	1.65		5.5	V
Input Voltage	$V_{IN}$		0		5.5	V
Output Voltage	$V_{OUT}$	High or low state			$V_{CC}$	V
Input Transition Rise or Fall Rate	$\Delta t/\Delta v$	$V_{CC}=1.65V \sim 2.7V$			20	ns/V
		$V_{CC}=2.7V \sim 5.5V$			10	ns/V
Operating Temperature	$T_A$		-40		+125	°C

## ■ ELECTRICAL CHARACTERISTICS (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	$T_A=25^\circ C$			$T_A=-40 \sim +125^\circ C$			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
High-Level Input Voltage	$V_{IH}$	$V_{CC}=1.65V \sim 1.95V$	0.65× $V_{CC}$			0.65× $V_{CC}$			V
		$V_{CC}=2.3V \sim 2.7V$	1.7			1.7			V
		$V_{CC}=2.7V \sim 3.6V$	2			2			V
		$V_{CC}=4.5V \sim 5.5V$	0.7× $V_{CC}$			0.7× $V_{CC}$			V
Low-Level Input Voltage	$V_{IL}$	$V_{CC}=1.65V \sim 1.95V$			0.35× $V_{CC}$			0.35× $V_{CC}$	V
		$V_{CC}=2.3V \sim 2.7V$			0.7			0.7	V
		$V_{CC}=2.7V \sim 3.6V$			0.8			0.8	V
		$V_{CC}=4.5V \sim 5.5V$			0.3× $V_{CC}$			0.3× $V_{CC}$	V
High-Level Output Voltage	$V_{OH}$	$V_{CC}=1.65V \sim 5.5V$ , $I_{OH}=-100\mu A$	$V_{CC}-$ 0.1			$V_{CC}-$ 0.1			V
		$V_{CC}=1.65V$ , $I_{OH}=-4mA$	1.2	1.54		0.95			V
		$V_{CC}=2.3V$ , $I_{OH}=-8mA$	1.9	2.15		1.7			V
		$V_{CC}=2.7V$ , $I_{OH}=-12mA$	2.2	2.5		1.9			V
		$V_{CC}=3.0V$ , $I_{OH}=-24mA$	2.3	2.62		2			V
		$V_{CC}=4.5V$ , $I_{OH}=-32mA$	3.8	4.11		3.4			V
Low-Level Output Voltage	$V_{OL}$	$V_{CC}=1.65V \sim 5.5V$ , $I_{OL}=100\mu A$			0.1			0.1	V
		$V_{CC}=1.65V$ , $I_{OL}=4mA$		0.07	0.45			0.7	V
		$V_{CC}=2.3V$ , $I_{OL}=8mA$		0.12	0.3			0.45	V
		$V_{CC}=2.7V$ , $I_{OL}=12mA$		0.17	0.4			0.6	V
		$V_{CC}=3.0V$ , $I_{OL}=24mA$		0.33	0.55			0.8	V
		$V_{CC}=4.5V$ , $I_{OL}=32mA$		0.39	0.55			0.8	V

## ■ ELECTRICAL CHARACTERISTICS (Cont.)

PARAMETER	SYMBOL	TEST CONDITIONS	T <sub>A</sub> =25°C			T <sub>A</sub> =-40~+125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
Input Leakage Current	I <sub>I(LEAK)</sub>	V <sub>CC</sub> =0 ~ 5.5V, V <sub>IN</sub> =5.5V or GND		±0.1	±5			±5	µA
Power OFF Leakage Current	I <sub>OFF</sub>	V <sub>CC</sub> =0V, V <sub>IN</sub> or V <sub>OUT</sub> =5.5V		±0.1	±10			±10	µA
Quiescent Supply Current	I <sub>CC</sub>	V <sub>CC</sub> =1.65V~5.5V, V <sub>IN</sub> =5.5V or GND, I <sub>OUT</sub> =0A		0.1	10			10	µA
Additional Quiescent Supply Current Per Input Pin	ΔI <sub>CC</sub>	V <sub>CC</sub> =2.3V~5.5V, One input at 0.6V, Other inputs at V <sub>CC</sub> or GND		5	500			500	µA

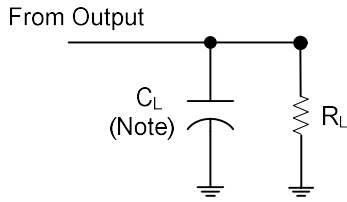
## ■ SWITCHING CHARACTERISTICS (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	T <sub>A</sub> =25°C			T <sub>A</sub> =-40~+125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
Propagation delay from input (I0 or I1) to output(Y)	t <sub>PD</sub>	V <sub>CC</sub> =1.65V ~ 1.95V	1.5		12.5	1.5		14.5	ns
		V <sub>CC</sub> =2.3V ~ 2.7V	1.0		7.1	1		8.6	ns
		V <sub>CC</sub> =2.7V	1.0		6.6	1		7.5	ns
		V <sub>CC</sub> =2.7V ~ 3.6V	1.0		5.5	1		6.5	ns
		V <sub>CC</sub> =4.5V ~ 5.5V	0.5		4.5	0.5		5.5	ns
Propagation delay from input (S) to output(Y)	t <sub>PD</sub>	V <sub>CC</sub> =1.65V ~ 1.95V	1.5		12.5	1.5		14.5	ns
		V <sub>CC</sub> =2.3V ~ 2.7V	1.0		7.9	1		9.4	ns
		V <sub>CC</sub> =2.7V	1.0		6.9	1		8.4	ns
		V <sub>CC</sub> =2.7V ~ 3.6V	1.0		5.5	1		6.5	ns
		V <sub>CC</sub> =4.5V ~ 5.5V	0.5		4.5	0.5		5.5	ns

## ■ OPERATING CHARACTERISTICS (T<sub>A</sub>=25°C , unless otherwise specified)

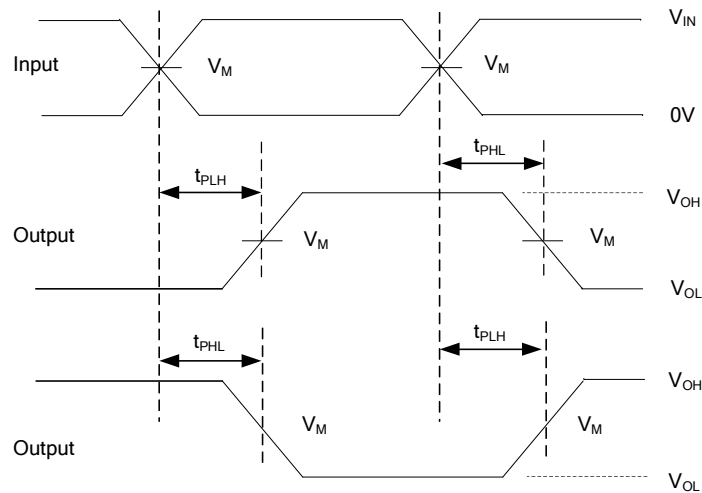
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Capacitance	C <sub>IN</sub>	V <sub>CC</sub> =3.3V, V <sub>IN</sub> = GND to V <sub>CC</sub>		2.5		pF
Power Dissipation Capacitance	C <sub>PD</sub>	V <sub>CC</sub> =3.3V, f=10MHz		18		pF

## ■ TEST CIRCUIT AND WAVEFORMS



Note:  $C_L$  includes probe and jig capacitance.

$V_{CC}$	Inputs		$C_L$	$R_L$
	$V_{IN}$	$t_{R, t_F}$		
$V_{CC} = 1.65V \sim 1.95V$	$V_{CC}$	$\leq 2ns$	30pF	1K $\Omega$
$V_{CC} = 2.3V \sim 2.7V$	$V_{CC}$	$\leq 2ns$	30pF	500 $\Omega$
$V_{CC} = 2.7V$	2.7V	$\leq 2.5ns$	50pF	500 $\Omega$
$V_{CC} = 2.7V \sim 3.6V$	2.7V	$\leq 2.5ns$	50pF	500 $\Omega$
$V_{CC} = 4.5V \sim 5.5V$	$V_{CC}$	$\leq 2.5ns$	50pF	500 $\Omega$



PROPAGATION DELAY TIMES

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

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