



U74LVC1G240

CMOS IC

SINGLE BUFFER/DRIVER WITH 3-STATE OUTPUT

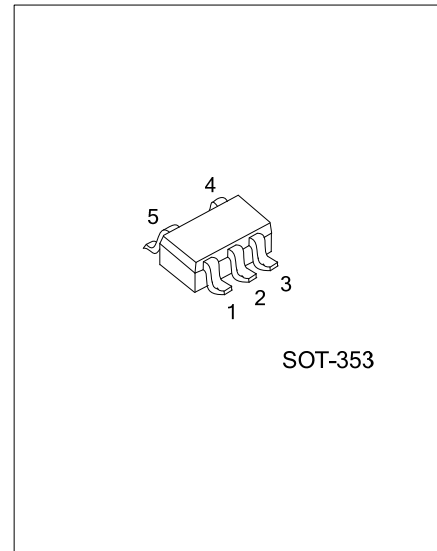
DESCRIPTION

The **U74LVC1G240** is a single line driver with a 3-state output. The output is disabled when the output-enable (\overline{OE}) input is high.

To ensure the high-impedance state during power up or power down, \overline{OE} should be tied to V_{CC} through a pullup resistor, the minimum value of the resistor is determined by the current-sinking capability of the driver.

FEATURES

- * Wide supply voltage range from 1.65V to 5.5V
- * Inputs accept voltages up to 5.5V
- * I_{OFF} supports partial-power-down mode
- * Low static power consumption; $I_{CC}=10\mu A$ (Max.)

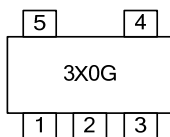


ORDERING INFORMATION

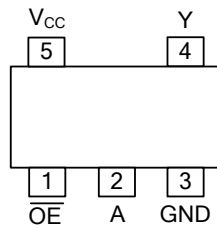
Ordering Number	Package	Packing
U74LVC1G240G-AL5-R	SOT-353	Tape Reel

<p>U74LVC1G240G-AL5-R</p> <p>(1) Packing Type (2) Package Type (3) Green Package</p>	<p>(1) R: Tape Reel (2) AL5: SOT-353 (3) G: Halogen Free and Lead Free</p>
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MARKING



■ PIN CONFIGURATION

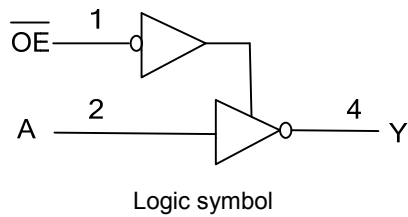


■ FUNCTION TABLE

INPUT(\overline{OE})	INPUT(A)	OUTPUT(Y)
L	H	L
L	L	H
H	X	Z

Note: H: HIGH voltage level; L: LOW voltage level.

■ LOGIC DIAGRAM (positive logic)



■ 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 high or low state	-0.5 ~ $V_{CC} + 0.5$	V
		Output in the power-off state	-0.5 ~ +6.5	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
		Data retention only	1.5			V
Input Voltage	V_{IN}		0		5.5	V
Output Voltage	V_{OUT}	High or low state	0		V_{CC}	V
Operating Temperature	T_A		-40		85	°C
Input Transition Rise or Fall Rate	$\Delta t/\Delta v$	$V_{CC}=1.8V\pm 0.15V, 2.5V\pm 0.2V$			20	ns/V
		$V_{CC}=3.3V\pm 0.3V$			10	ns/V
		$V_{CC}=5V\pm 0.5V$			5	ns/V

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
High-level Input Voltage	V_{IH}	$V_{CC}=1.8\pm 0.15V$	$0.65 \times V_{CC}$			V	
		$V_{CC}=2.5\pm 0.2V$	1.7			V	
		$V_{CC}=3.3\pm 0.3V$	2			V	
		$V_{CC}=5\pm 0.5V$	$0.7 \times V_{CC}$			V	
Low-level Input Voltage	V_{IL}	$V_{CC}=1.8\pm 0.15V$			$0.35 \times V_{CC}$	V	
		$V_{CC}=2.5\pm 0.2V$			0.7	V	
		$V_{CC}=3.3\pm 0.3V$			0.8	V	
		$V_{CC}=5\pm 0.5V$			$0.3 \times V_{CC}$	V	
High-Level Output Voltage	V_{OH}	$V_{CC}=1.65 \sim 5.5V, I_{OH}=-100\mu A$	$V_{CC}-0.1$			V	
		$V_{CC}=1.65V, I_{OH}=-4mA$	1.2			V	
		$V_{CC}=2.3V, I_{OH}=-8mA$	1.9			V	
		$V_{CC}=3.0V$	$I_{OH}=-16mA$	2.4			V
		$I_{OH}=-24mA$	2.3			V	
Low-Level Output Voltage	V_{OL}	$V_{CC}=1.65 \sim 5.5V, I_{OH}=100\mu A$			0.1	V	
		$V_{CC}=1.65V, I_{OH}=4mA$			0.45	V	
		$V_{CC}=2.3V, I_{OH}=8mA$			0.3	V	
		$V_{CC}=3.0V$	$I_{OH}=16mA$			0.4	V
		$I_{OH}=24mA$			0.55	V	
		$V_{CC}=4.5V, I_{OH}=32mA$			0.55	V	
Input Leakage Current	$I_{I(LEAK)}$	$V_{CC}=0 \sim 5.5V, V_{IN}=5.5V$ or GND			±5	μA	
Power OFF Leakage Current	I_{off}	$V_{CC}=0V, V_{IN}$ or $V_{OUT}=5.5V$			±10	μA	
OFF-state output current	I_{OZ}	$V_{CC}=3.6V, V_{IN} = V_{IH}$ or $V_{IL}, V_{OUT}=5.5V$ or GND			10	μA	

■ ELECTRICAL CHARACTERISTICS (Cont.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Quiescent Supply Current	I_{CC}	$V_{CC}=1.65 \sim 5.5V$, $V_{IN}=V_{CC}$ or GND, $I_{OUT}=0$			10	μA
Additional Quiescent Supply Current Per Input Pin	ΔI_{CC}	$V_{CC}=3 \sim 5.5V$, 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		4.0		pF

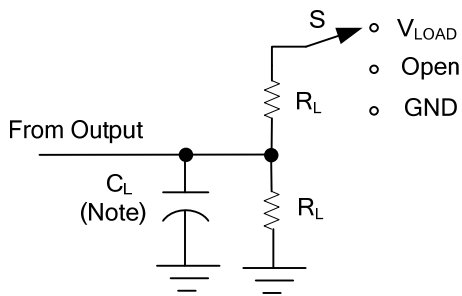
■ SWITCHING CHARACTERISTICS ($T_A = 25^\circ C$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
Propagation delay from input (A) to output(Y)	t_{PD}	$C_L=15pF$ $R_L=1M\Omega$	$V_{CC}=1.8V \pm 0.15V$	2.1		6.9	ns
			$V_{CC}=2.5V \pm 0.2V$	0.9		4.6	ns
			$V_{CC}=3.3V \pm 0.3V$	0.7		3.7	ns
			$V_{CC}=5.0V \pm 0.5V$	0.5		3.4	ns
		$C_L=30pF$, $R_L=1k\Omega$	$V_{CC}=1.8V \pm 0.15V$	3		8.6	ns
		$C_L=30pF$ $R_L=500\Omega$	$V_{CC}=2.5V \pm 0.2V$	1.4		5.5	ns
Propagation delay from input (\overline{OE}) to output(Y)	t_{en}	$C_L=50pF$ $R_L=500\Omega$	$V_{CC}=3.3V \pm 0.3V$	1.1		4.5	ns
			$V_{CC}=5.0V \pm 0.5V$	1		4	ns
		$C_L=30pF$, $R_L=1k\Omega$	$V_{CC}=1.8V \pm 0.15V$	3.8		10	ns
			$V_{CC}=2.5V \pm 0.2V$	2.1		6.5	ns
Propagation delay from input (\overline{OE}) to output(Y)	t_{dis}	$C_L=50pF$ $R_L=500\Omega$	$V_{CC}=3.3V \pm 0.3V$	1.4		5.4	ns
			$V_{CC}=5.0V \pm 0.5V$	1.1		5.2	ns
		$C_L=30pF$, $R_L=1k\Omega$	$V_{CC}=1.8V \pm 0.15V$	2.1		9.4	ns
			$V_{CC}=2.5V \pm 0.2V$	1		4.9	ns
Propagation delay from input (\overline{OE}) to output(Y)	t_{dis}	$C_L=50pF$ $R_L=500\Omega$	$V_{CC}=3.3V \pm 0.3V$	1.4		5.2	ns
			$V_{CC}=5.0V \pm 0.5V$	1		4.1	ns

■ OPERATING CHARACTERISTICS ($f=10MHz$, $T_A = 25^\circ C$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	Output enabled	$V_{CC}=1.8V$		17		pF
		$V_{CC}=2.5V$		17		pF
		$V_{CC}=3.3V$		18		pF
		$V_{CC}=5V$		20		pF
	Output disabled	$V_{CC}=1.8V$		1		pF
		$V_{CC}=2.5V$		1		pF
		$V_{CC}=3.3V$		1		pF
		$V_{CC}=5V$		3		pF

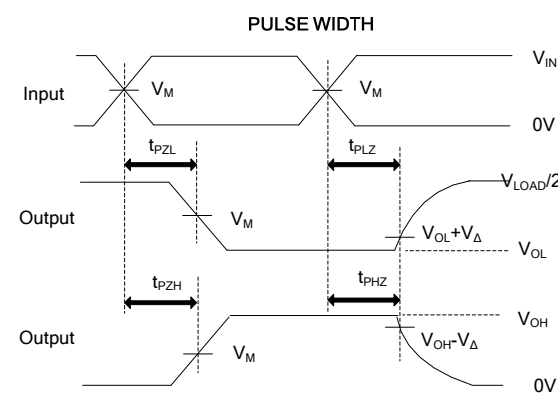
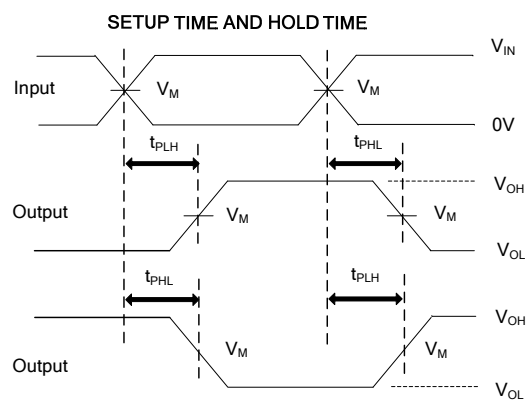
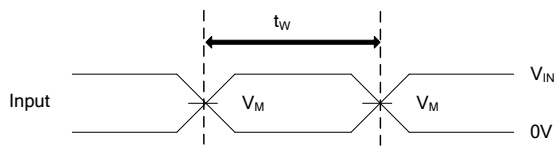
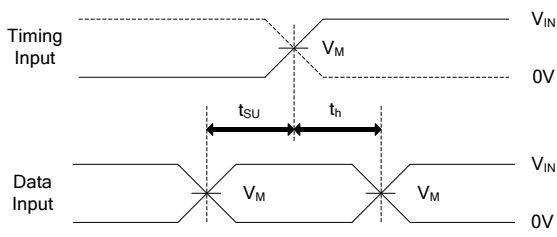
TEST CIRCUIT AND WAVEFORMS



TEST	S
t_{PLH}/t_{PHL}	Open
t_{PLZ}/t_{PZL}	V_{LOAD}
t_{PHZ}/t_{PZH}	GND

Note: C_L includes probe and jig capacitance.

V_{CC}	V_{IN}	t_R / t_F	V_M	V_{LOAD}	C_L	R_L	V_{Δ}
$1.8V \pm 0.15V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	$2 \times V_{CC}$	30pF	1K Ω	0.15V
$2.5V \pm 0.2V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	$2 \times V_{CC}$	30pF	500 Ω	0.15V
$3.3V \pm 0.3V$	3V	$\leq 2.5ns$	1.5V	6V	50pF	500 Ω	0.3V
$5V \pm 0.5V$	V_{CC}	$\leq 2.5ns$	$V_{CC}/2$	$2 \times V_{CC}$	50pF	500 Ω	0.3V



PROPAGATION DELAY TIMES

ENABLE AND DISABLE 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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