



U74LVC241

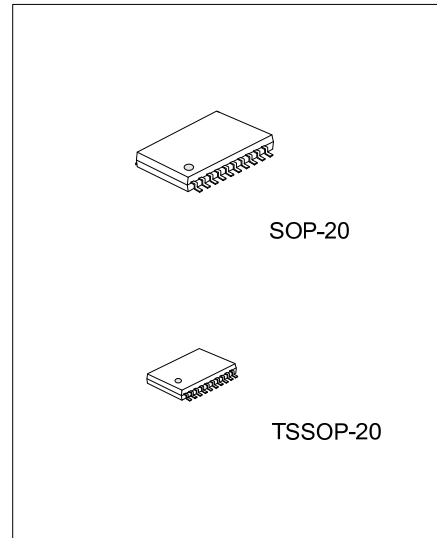
CMOS IC

OCTAL BUFFER/DRIVER WITH 3-STATE OUTPUTS

DESCRIPTION

The **U74LVC241** contains two 4-bit line drivers with separate output-enable(1 OE /2OE) inputs. When (1 OE /2OE) is low and high, the device passes data from the A to the Y. When(1 OE /2OE) is high and low, the outputs are in the high-impedance state.

The **U74LVC241** can be used in a mixed 3.3V/5V system environment. This device has power-down protective circuit, preventing device destruction when it is powered down.



FEATURES

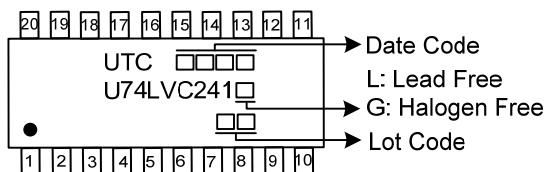
- * Operate From 1.65V to 3.6V
- * Input Accept Voltages to 5.5V
- * Partial-Power-Down Mode Operation
- * Max tpd is 6.1ns at 3.3V

ORDERING INFORMATION

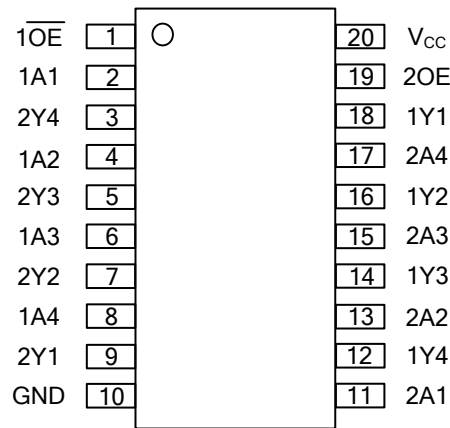
Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74LVC241L-S20-R	U74LVC241G-S20-R	SOP-20	Tape Reel
U74LVC241L-P20-R	U74LVC241G-P20-R	TSSOP-20	Tape Reel

<p>U74LVC241G-R20-R</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Green Package</p>	<p>(1) R: Tape Reel</p> <p>(2) R20: SSOP-20, P20: TSSOP-20</p> <p>(3) G: Halogen Free and Lead Free</p>
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MARKING



■ PIN CONFIGURATION

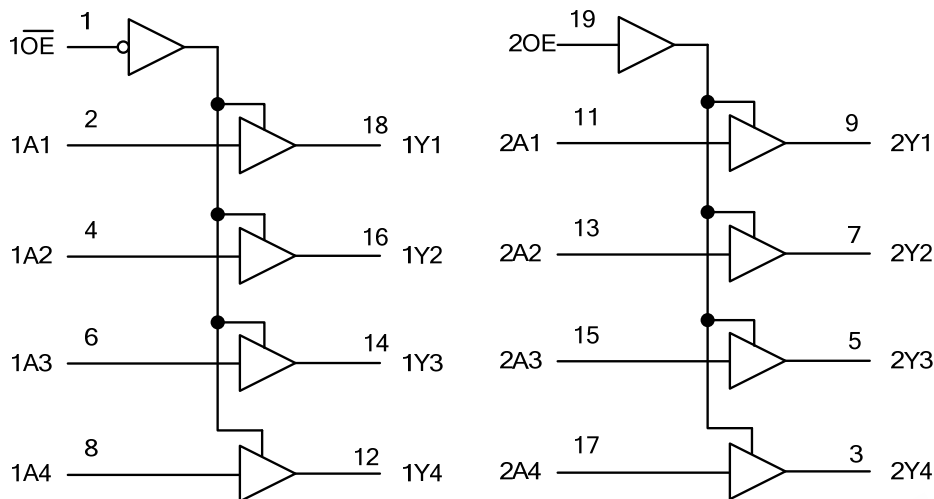


■ FUNCTION TABLE (each gate)

INPUT				OUTPUT	
$\overline{1OE}$	1An	2OE	2An	1Yn	2Yn
L	L	H	L	L	L
L	H	H	H	H	H
H	X	L	X	Z	Z

H = High voltage level ; L = Low voltage level
 X = Don't care ; Z = High-impedance OFF-state

■ 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		3.6	V
		Data retention only	1.2			V
Input Voltage	V_{IN}		0		5.5	V
Output Voltage	V_{OUT}	High or low state	0		V_{CC}	V
		Power-off state	0		5.5	V
Operating Temperature	T_A		-40		85	°C
Input Transition Rise or Fall Rate	$\Delta t/\Delta v$	$V_{CC}=1.65V \sim 2.7V$	0		20	ns/V
		$V_{CC}=2.7V \sim 3.6V$	0		10	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}	$V_{CC}=1.8V \pm 0.15V$	$0.65 \times V_{CC}$			V
		$V_{CC}=2.5V \pm 0.2V$	1.7			V
		$V_{CC}=3.3V \pm 0.3V$	2			V
Low-level Input Voltage	V_{IL}	$V_{CC}=1.8V \pm 0.15V$			$0.35 \times V_{CC}$	V
		$V_{CC}=2.5V \pm 0.2V$			0.7	V
		$V_{CC}=3.3V \pm 0.3V$			0.8	V
High-Level Output Voltage	V_{OH}	$V_{CC}=1.65 \sim 3.6V, I_{OH}=-100\mu A$	$V_{CC}-0.2$			V
		$V_{CC}=1.65V, I_{OH}=-4mA$	1.2			V
		$V_{CC}=2.3V, I_{OH}=-8mA$	1.7			V
		$V_{CC}=2.7V, I_{OH}=-12mA$	2.2			V
		$V_{CC}=3.0V$				
		$I_{OH}=-18mA$	2.4			V
		$I_{OH}=-24mA$	2.2			V
Low-Level Output Voltage	V_{OL}	$V_{CC}=1.65 \sim 3.6V, I_{OL}=100\mu A$			0.2	V
		$V_{CC}=1.65V, I_{OL}=4mA$			0.45	V
		$V_{CC}=2.3V, I_{OL}=8mA$			0.7	V
		$V_{CC}=2.7V, I_{OL}=12mA$			0.4	V
		$V_{CC}=3.0V, I_{OL}=24mA$			0.55	V

■ ELECTRICAL CHARACTERISTICS (Cont.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Leakage Current	$I_{I(LEAK)}$	$V_{CC}=3.6V, V_{IN}=5.5V$ or GND		± 0.1	± 5	μA
Power OFF Leakage Current	I_{off}	$V_{CC}=0V, V_{IN}$ or $V_{OUT}=5.5V$		0.1	± 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		0.1	± 10	μA
Quiescent Supply Current	I_{CC}	$V_{CC}=2.7 \sim 3.6V, V_{IN}=V_{CC} - 0.6V, I_{OUT}=0A$		0.1	10	μA
Additional Quiescent Supply Current Per Input Pin	ΔI_{CC}	$V_{CC}=3 \sim 5.5V, \text{One input at } V_{CC}-0.6V, \text{Other inputs at } V_{CC}$ or GND		5	500	μA
Input Capacitance	C_I	$V_{CC}=0 \sim 3.6V, V_{IN}=GND$ to V_{CC}		5.0		pF

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

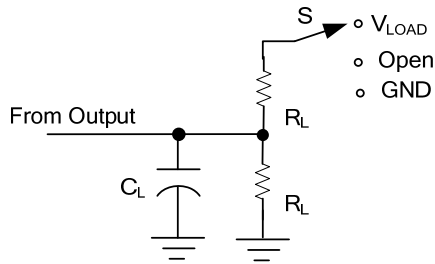
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from input (An) to output(Yn)	t_{PD}	$V_{CC}=1.8V \pm 0.15V$	1.5	5.9	14.1	ns
		$V_{CC}=2.5V \pm 0.2V$	1.0	3.2	7.3	ns
		$V_{CC}=2.7V$	1.5	3.2	7.1	ns
		$V_{CC}=3.3V \pm 0.3V$	1.5	2.7	6.1	ns
Propagation delay from input (1 \overline{OE}) to output(1Yn)	t_{en}	$V_{CC}=1.8V \pm 0.15V$	1.5	6.6	16.2	ns
		$V_{CC}=2.5V \pm 0.2V$	1.5	3.7	8.9	ns
		$V_{CC}=2.7V$	1.5	3.8	8.1	ns
		$V_{CC}=3.3V \pm 0.3V$	1.5	3.0	7.1	ns
Propagation delay from input (2OE) to output(2Yn)	t_{en}	$V_{CC}=1.8V \pm 0.15V$	2.5	5.5	13.8	ns
		$V_{CC}=2.5V \pm 0.2V$	2.1	4.2	7.4	ns
		$V_{CC}=2.7V$	1.5	3.7	8.1	ns
		$V_{CC}=3.3V \pm 0.3V$	1.5	3.4	7.1	ns
Propagation delay from input (1 \overline{OE}) to output(1Yn)	t_{dis}	$V_{CC}=1.8V \pm 0.15V$	2.5	4.3	10	ns
		$V_{CC}=2.5V \pm 0.2V$	1.0	3.5	5.6	ns
		$V_{CC}=2.7V$	1.5	3.2	7.0	ns
		$V_{CC}=3.3V \pm 0.3V$	1.5	3.0	6.0	ns
Propagation delay from input (2OE) to output(2Yn)	t_{dis}	$V_{CC}=1.8V \pm 0.15V$	1.5	3.5	9.9	ns
		$V_{CC}=2.5V \pm 0.2V$	0.5	3.1	5.6	ns
		$V_{CC}=2.7V$	1.5	3.4	7.0	ns
		$V_{CC}=3.3V \pm 0.3V$	1.5	2.6	6.0	ns

■ OPERATING CHARACTERISTICS

($f=10MHz, V_{IN}=GND$ to $V_{CC}, T_A = 25^\circ C$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C_{PD}	$V_{CC}=1.8V \pm 0.15V$		14.4		pF
		$V_{CC}=2.5V \pm 0.2V$		17.9		pF
		$V_{CC}=3.3V \pm 0.3V$		21		pF

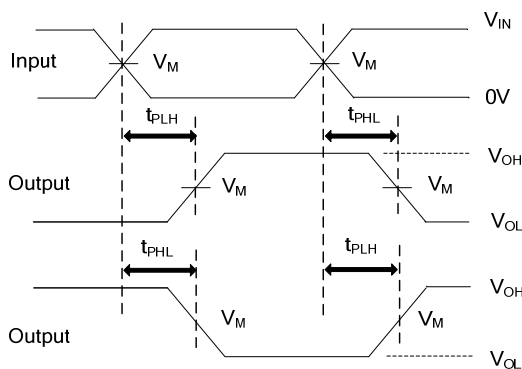
TEST CIRCUIT AND WAVEFORMS



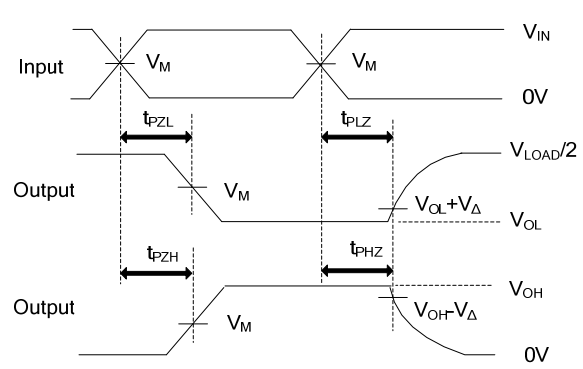
TEST	S
t_{PLH}/t_{PHL}	Open
t_{PHZ}/t_{PZH}	GND
t_{PLZ}/t_{PLZ}	V_{LOAD}

TEST CIRCUIT

V_{CC}	V_{IN}	t_R/t_F	V_M	V_{Δ}	C_L	R_L	V_{EXT}		
							t_{PLH}/t_{PHL}	t_{PZH}/t_{PHZ}	t_{PLZ}/t_{PLZ}
$1.8V \pm 0.15V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	0.15V	30pF	1K Ω	OPEN	GND	$2 \times V_{CC}$
$2.5V \pm 0.2V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	0.15V	30pF	500 Ω	OPEN	GND	$2 \times V_{CC}$
2.7V	2.7V	$\leq 2.5ns$	1.5V	0.3V	50pF	500 Ω	OPEN	GND	$2 \times V_{CC}$
$3.3V \pm 0.3V$	2.7V	$\leq 2.5ns$	1.5V	0.3V	50pF	500 Ω	OPEN	GND	$2 \times V_{CC}$



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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