



U74LVC2G86

CMOS IC

DUAL 2-INPUT EXCLUSIVE-OR GATE

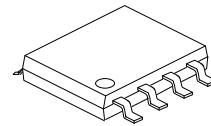
DESCRIPTION

The **U74LVC2G86** is a dual 2-input exclusive-OR gate which provides the function $Y=A \oplus B$ or $Y=\overline{AB}+\overline{A\overline{B}}$.

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

FEATURES

- * Operate from 1.65V to 5.5V
- * Inputs accept voltages to 5.5V
- * I_{off} supports partial-power-down mode
- * Low power dissipation, $I_{CC}=10\mu A$ (Max)
- * Max t_{PD} of 4.7 ns at 3.3V
- * $\pm 24mA$ output drive($V_{CC}=3.3V$)



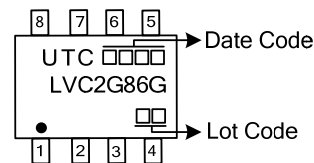
SOP-8

ORDERING INFORMATION

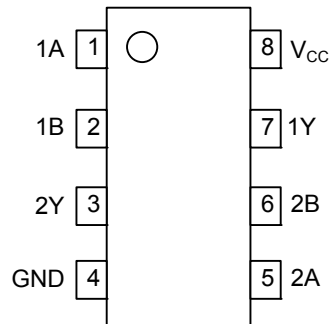
Ordering Number	Package	Packing
U74LVC2G86G-S08-R	SOP-8	Tape Reel

<p>U74LVC2G86G-S08-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) S08: SOP-8</p> <p>(3) G: Halogen Free and Lead Free</p>
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MARKING



■ PIN CONFIGURATION

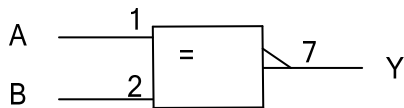
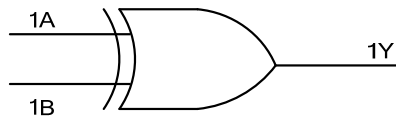
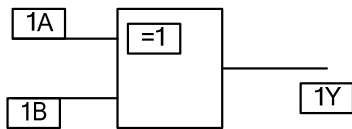


■ FUNCTION TABLE

INPUT		OUTPUT
A	B	Y
L	L	L
L	H	H
H	L	H
H	H	L

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

■ LOGIC DIAGRAM (positive logic)



IEC logic symbol

■ 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	Output in the high or low state	V_{OUT}	-0.5 ~ $V_{CC}+0.5$	V
	Output in the high-impedance or power-off state		-0.5 ~ +6.5	V
V_{CC} or GND Current		I_{CC}	±100	mA
Continuous Output Current ($V_{OUT}=0$ to V_{CC})		I_{OUT}	±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

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 ($T_A = 25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-level Input Voltage	V_{IH}	$V_{CC}=1.65V \sim 1.95V$	$0.65 \cdot V_{CC}$			V
		$V_{CC}=2.3V \sim 2.7V$	1.7			V
		$V_{CC}=3V \sim 3.6V$	2			V
		$V_{CC}=4.5V \sim 5.5V$	$0.7 \cdot V_{CC}$			V
Low-level Input Voltage	V_{IL}	$V_{CC}=1.65V \sim 1.95V$			$0.35 \cdot V_{CC}$	V
		$V_{CC}=2.3V \sim 2.7V$			0.7	V
		$V_{CC}=3V \sim 3.6V$			0.8	V
		$V_{CC}=4.5V \sim 5.5V$			$0.3 \cdot V_{CC}$	V
High-Level Output Voltage	V_{OH}	$I_{OH}=-100\mu A$	$V_{CC}=1.65 \sim 5.5V$	$V_{CC}-0.1$		V
		$I_{OH}=-4mA$	$V_{CC}=1.65V$	1.2		V
		$I_{OH}=-8mA$	$V_{CC}=2.3V$	1.9		V
		$I_{OH}=-16mA$	$V_{CC}=3.0V$	2.4		V
		$I_{OH}=-24mA$	$V_{CC}=3.0V$	2.3		V
		$I_{OH}=-32mA$	$V_{CC}=4.5V$	3.8		V
Low-Level Output Voltage	V_{OL}	$I_{OL}=100\mu A$	$V_{CC}=1.65 \sim 5.5V$		0.1	V
		$I_{OL}=4mA$	$V_{CC}=1.65V$		0.45	V
		$I_{OL}=8mA$	$V_{CC}=2.3V$		0.3	V
		$I_{OL}=16mA$	$V_{CC}=3.0V$		0.4	V
		$I_{OL}=24mA$	$V_{CC}=3.0V$		0.55	V
		$I_{OL}=32mA$	$V_{CC}=4.5V$		0.55	V
Input Leakage Current	$I_{I(LEAK)}$	$V_{IN}=5.5V$ or GND, $V_{CC}=0 \sim 5.5V$			±5	μA
Power OFF Leakage Current	I_{off}	V_{IN} or $V_{OUT}=5.5V, V_{CC}=0V$			±10	μA

■ ELECTRICAL CHARACTERISTICS(Cont.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Quiescent Supply Current	I_{CC}	$V_{IN}=5.5V$ or GND, $I_{OUT}=0$ $V_{CC}=1.65 \sim 5.5V$			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		5		pF

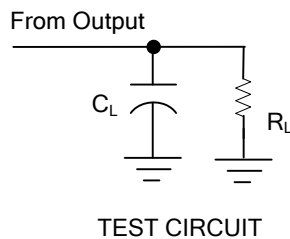
■ SWITCHING CHARACTERISTICS ($T_A = 25^\circ C$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from input (A or B) to output(Y)	t_{PLH}/t_{PHL}	$V_{CC}=1.8V \pm 0.15V$, $C_L=30pF$	4.1		9.9	ns
		$V_{CC}=2.5V \pm 0.2V$, $C_L=30pF$	2		5.7	ns
		$V_{CC}=3.3V \pm 0.3V$, $C_L=50pF$	1.6		4.7	ns
		$V_{CC}=5V \pm 0.5V$, $C_L=50pF$	1.4		3.6	ns

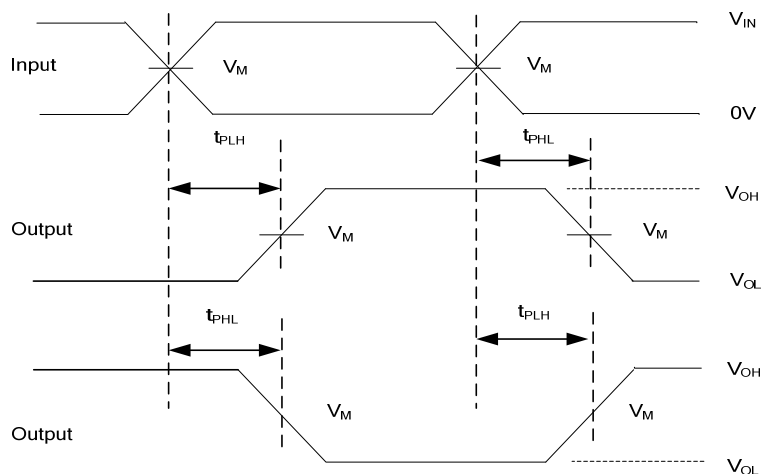
■ OPERATING CHARACTERISTICS ($T_A = 25^\circ C$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C_{PD}	$V_{CC}=3.3V$, $f=10MHz$		21		pF

■ TEST CIRCUIT AND WAVEFORMS(Cont.)



V _{CC}	Inputs		V _M	C _L	R _L
	V _{IN}	t _R , t _F			
1.8V±0.15V	V _{CC}	≤2ns	V _{CC} /2	30pF	1KΩ
2.5V±0.2V	V _{CC}	≤2ns	V _{CC} /2	30pF	500Ω
3.3V±0.3V	3V	≤2.5ns	1.5V	50pF	500Ω
5V±0.5V	V _{CC}	≤2.5ns	V _{CC} /2	50pF	500Ω



PROPAGATION DELAY TIMES

Note: C_L includes probe and jig capacitance.

All input pulses are supplied by generators having the following characteristics: PRR ≤10MHz, Z_o = 50Ω.

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