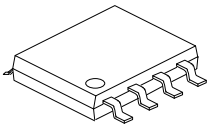
U74LVC2G86

CMOS IC

DUAL 2-INPUT EXCLUSIVE-OR GATE



SOP-8

■ DESCRIPTION

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

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

■ FEATURES

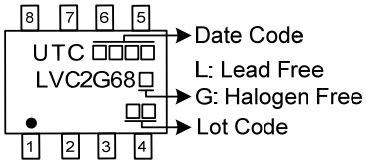
* Operate from 1.65V to 5.5V
* Inputs accept voltages to 5.5V
* I_{off} supports partial-power-down mode
* Low power dissipation, I_{CC}=10μA (Max)
* Max t_{PD} of 4.7 ns at 3.3V
* ±24mA output drive(V_{CC}=3.3V)

■ ORDERING INFORMATION

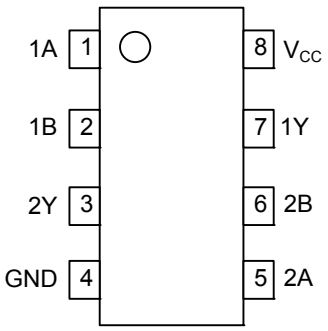
Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74LVC2G86L-S08-R	U74LVC2G86G-S08-R	SOP-8	Tape Reel

U74LVC2G86G-S08-R (1)Packing Type (2)Package Type (3)Green Package	(1) R: Tape Reel (2) S08: SOP-8 (3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



■ PIN CONFIGURATION

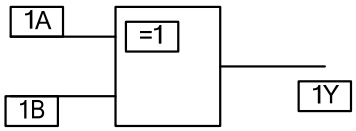


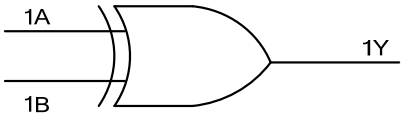
■ FUNCTION TABLE

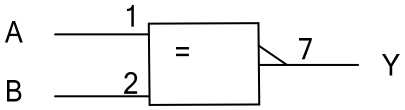
INPUT		OUTPUT
A	B	Y
L	L	L
L	H	H
H	L	H
H	H	L

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	Δt/Δv	V_{CC}=1.8V±0.15V, 2.5V±0.2V			20	ns/V
		V_{CC}=3.3V±0.3V			10	ns/V
		V_{CC}=5V±0.5V			5	ns/V

■ ELECTRICAL CHARACTERISTICS (T_A =25°C , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-level Input Voltage	V_{IH}	V_{CC}=1.65V ~ 1.95V	0.65*V_{CC}			V
		V_{CC}=2.3V ~ 2.7V	1.7			V
		V_{CC}=3V ~ 3.6V	2			V
		V_{CC}=4.5V ~ 5.5V	0.7*V_{CC}			V
Low-level Input Voltage	V_{IL}	V_{CC}=1.65V ~ 1.95V			0.35*V_{CC}	V
		V_{CC}=2.3V ~ 2.7V			0.7	V
		V_{CC}=3V ~ 3.6V			0.8	V
		V_{CC}=4.5V ~ 5.5V			0.3*V_{CC}	V
High-Level Output Voltage	V_{OH}	V_{CC}=1.65 ~ 5.5V, I_{OH}=-100μA	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
		V_{CC}=3.0V, I_{OH}=-24mA	2.3			V
		V_{CC}=4.5V, I_{OH}=-32mA	3.8			V
Low-Level Output Voltage	V_{OL}	V_{CC}=1.65 ~ 5.5V, I_{OL}=100μA			0.1	V
		V_{CC}=1.65V, I_{OL}=4mA			0.45	V
		V_{CC}=2.3V, I_{OL}=8mA			0.3	V
		V_{CC}=3.0V, I_{OL}=16mA			0.4	V
		V_{CC}=3.0V, I_{OL}=24mA			0.55	V
		V_{CC}=4.5V, I_{OL}=32mA			0.55	V
Input Leakage Current	$I_{I(LEAK)}$	V_{IN}=5.5V or GND, V_{CC}=0 ~ 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 ~ 5.5V			10	μA
Additional Quiescent Supply Current Per Input Pin	ΔI_{CC}	V_{CC}=3 ~ 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

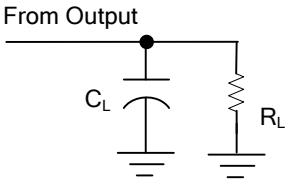
■ SWITCHING CHARACTERISTICS (T_A =25°C , unless otherwise specified)

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±0.15V, C_L=30pF	4.1		9.9	ns
		V_{CC}=2.5V±0.2V, C_L=30pF	2		5.7	ns
		V_{CC}=3.3V±0.3V, C_L=50pF	1.6		4.7	ns
		V_{CC}=5V±0.5V, C_L=50pF	1.4		3.6	ns

■ OPERATING CHARACTERISTICS (T_A =25°C , unless otherwise specified)

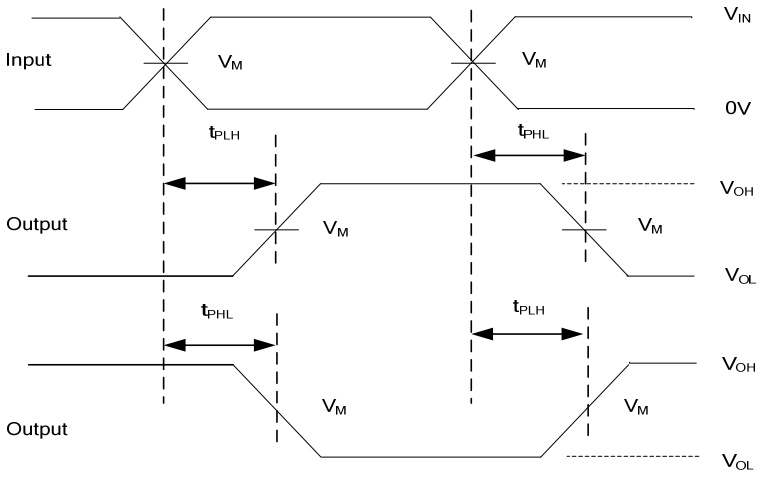
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C_{PD}	V_{CC}=3.3V, f=10MH$_Z$		21		pF

■ TEST CIRCUIT AND WAVEFORMS(Cont.)



TEST CIRCUIT

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, Zo = 50Ω.