



U74AUC1G86

CMOS IC

SINGLE 2-INPUT EXCLUSIVE-OR GATE

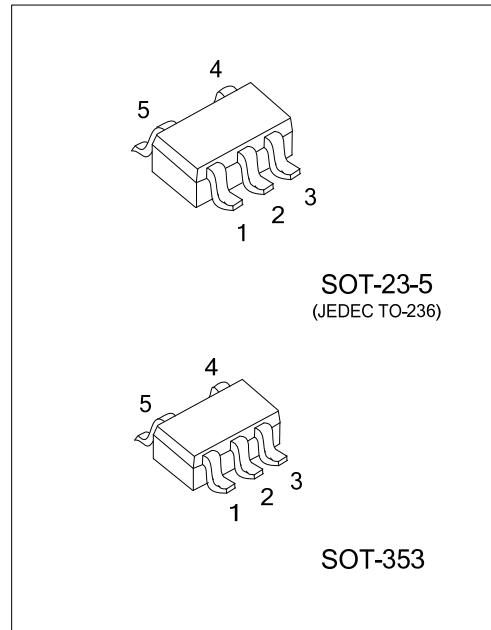
DESCRIPTION

The **U74AUC1G86** is a single 2-input exclusive-OR gate which provides the Function $Y = A \oplus B$ or $Y = \overline{AB} + A\overline{B}$ in positive logic.

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

FEATURES

- * Operate from 0.8V to 2.7V
- * Low power dissipation : $I_{CC}=10\mu A$ (Max.)
- * $\pm 8mA$ Output Driver : $V_{CC}=1.8V$
- * I_{off} Supports partial-Power-Down Mode Operation

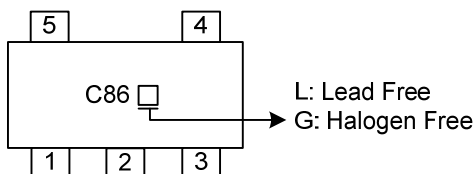


ORDERING INFORMATION

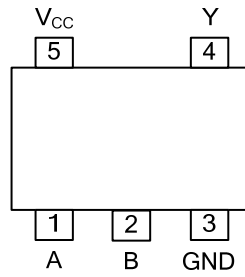
Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74AUC1G86L-AE5-R	U74AUC1G86G-AE5-R	SOT-23-5	Tape Reel
U74AUC1G86L-AL5-R	U74AUC1G86G-AL5-R	SOT-353	Tape Reel

<p>U74AUC1G86G-AE5-R</p> <p>(1) Packing Type (2) Package Type (3) Green Package</p>	<p>(1) R: Tape Reel (2) AE5: SOT-23-5, AL5: SOT-353 (3) G: Halogen Free and Lead Free, L: Lead Free</p>
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MARKING



■ PIN CONFIGURATION

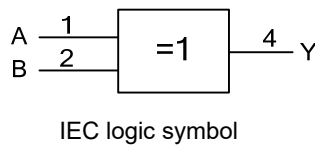
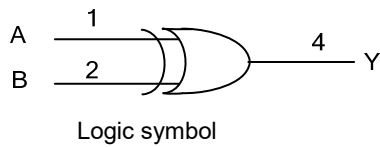


■ FUNCTION TABLE

INPUT(A)	INPUT(B)	OUTPUT(Y)
L	L	L
H	L	H
L	H	H
H	H	L

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

■ LOGIC DIAGRAM (positive logic)



■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	TEST CONDITIONS	RATINGS	UNIT
Supply Voltage	V_{CC}		-0.5 ~ +3.6	V
Input Voltage	V_{IN}		-0.5 ~ +3.6	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 ~ +3.6	V
V_{CC} or GND Current	I_{CC}		±100	mA
Continuous Output Current	I_{OUT}	$V_{OUT}=0 \sim V_{CC}$	±20	mA
Input Clamp Current	I_{IK}	$V_{IN}<0$	-50	mA
Output Clamp Current	I_{OK}	$V_O>V_{CC}$ or $V_{OUT}<0$	-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	0.8		2.7	V
Input Voltage	V_{IN}		0		3.6	V
Output Voltage	V_{OUT}	High or low state	0		V_{CC}	V
Input Transition Rise or Fall Rate	$\Delta t/\Delta v$	$V_{CC}=0.8V \sim 1.95V$			20	ns/V
		$V_{CC}=2.3V \sim 2.7V$			10	ns/V
Operating Temperature	T_A		-40		+125	°C

■ 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}	$V_{CC}=0.8V$	V_{CC}			V
		$V_{CC}=1.1V \sim 1.95V$	$0.65 \times V_{CC}$			V
		$V_{CC}=2.3V \sim 2.7V$	1.7			V
Low-level Input Voltage	V_{IL}	$V_{CC}=0.8V$			0	V
		$V_{CC}=1.1V \sim 1.95V$			$0.35 \times V_{CC}$	V
		$V_{CC}=2.3V \sim 2.7V$			0.7	V
High-Level Output Voltage	V_{OH}	$V_{CC}=0.8 \sim 2.7V, I_{OH}=-100\mu A$	$V_{CC}-0.1$			V
		$V_{CC}=0.8V, I_{OH}=-700\mu A$		0.55		V
		$V_{CC}=1.1V, I_{OH}=-3mA$	0.8			V
		$V_{CC}=1.4V, I_{OH}=-5mA$	1			V
		$V_{CC}=1.65V, I_{OH}=-8mA$	1.2			V
Low-Level Output Voltage	V_{OL}	$V_{CC}=2.3V, I_{OH}=-9mA$	1.8			V
		$V_{CC}=0.8 \sim 2.7V, I_{OL}=100\mu A$			0.2	V
		$V_{CC}=0.8V, I_{OL}=700\mu A$		0.25		V
		$V_{CC}=1.1V, I_{OL}=3mA$			0.3	V
		$V_{CC}=1.4V, I_{OL}=5mA$			0.4	V
Input Leakage Current	$I_{I(LEAK)}$	$V_{CC}=0 \sim 2.7V, V_{IN}=V_{CC}$ or GND		±0.1	±5	μA
		$V_{CC}=0V, V_{IN}$ or $V_{OUT}=2.7V$		±0.1	±10	μA
Quiescent Supply Current	I_{CC}	$V_{CC}=0.8 \sim 2.7V, V_{IN}=V_{CC}$ or GND $I_{OUT}=0$		0.1	10	μA
Input Capacitance	C_I	$V_{CC}=2.5V, V_{IN}=V_{CC}$ or GND		2.5		pF

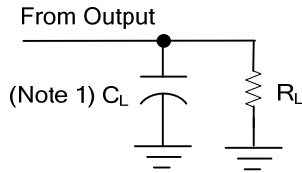
■ SWITCHING CHARACTERISTICS ($T_A = 25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
Propagation delay from input to output	t_{PLH} / t_{PHL}	$C_L = 15\text{pF}$, $R_L = 2\text{k}\Omega$	$V_{CC} = 0.8\text{V}$		5.5		ns
			$V_{CC} = 1.2 \pm 0.1\text{V}$	0.8			ns
			$V_{CC} = 1.5 \pm 0.1\text{V}$	0.5			ns
			$V_{CC} = 1.8 \pm 0.15\text{V}$	0.4	1		ns
			$V_{CC} = 2.5 \pm 0.2\text{V}$	0.3			ns
		$C_L = 30\text{pF}$, $R_L = 1\text{k}\Omega$	$V_{CC} = 1.8 \pm 0.15\text{V}$	0.8	1.5		ns
	$C_L = 30\text{pF}$, $R_L = 500\Omega$	$V_{CC} = 2.5 \pm 0.2\text{V}$	0.7			ns	

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

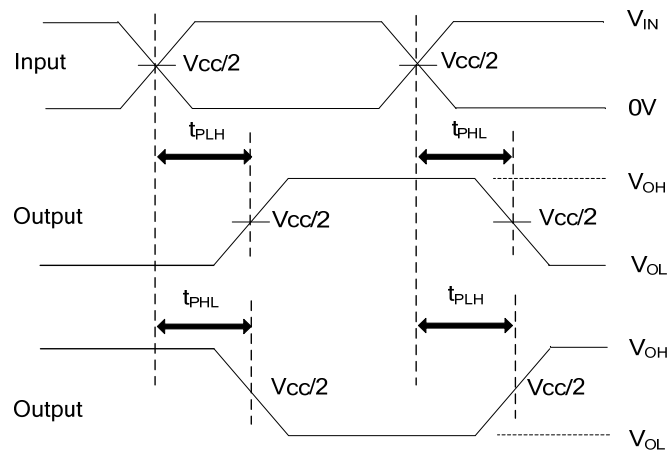
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C_{PD}	$V_{CC} = 0.8\text{V}$		16		pF
		$V_{CC} = 1.2\text{V}$		16		pF
		$V_{CC} = 1.5\text{V}$		16.5		pF
		$V_{CC} = 1.8\text{V}$		17		pF
		$V_{CC} = 2.5\text{V}$		18.5		pF

■ TEST CIRCUIT AND WAVEFORMS



TEST CIRCUIT

V_{CC}	C_L	R_L	V_M
0.8V	15pF	2k Ω	$V_{CC}/2$
1.2V \pm 0.1V	15pF	2k Ω	$V_{CC}/2$
1.5V \pm 0.1V	15pF	2k Ω	$V_{CC}/2$
1.8V \pm 0.15V	15pF	2k Ω	$V_{CC}/2$
2.5V \pm 0.2V	15pF	2k Ω	$V_{CC}/2$
1.8V \pm 0.15V	30pF	1k Ω	$V_{CC}/2$
2.5V \pm 0.2V	30pF	500 Ω	$V_{CC}/2$



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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