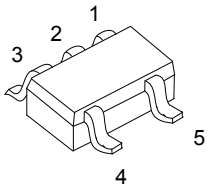
U74AHC1G86

CMOS IC

2-INPUT EXCLUSIVE-OR GATE



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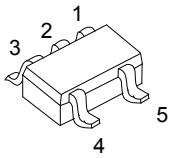


SOT-353

■ DESCRIPTION

The U74AHC1G86 is a 2-input EXCLUSIVE-OR gate, it provides the Function Y=A⊕B.

■ FEATURES

* Operation voltage range: 2 ~ 5.5V
* Low power dissipation: I_{CC}=10μA(Max)
* High speed: t_{PD}=4.3ns(Typ)

■ ORDERING INFORMATION

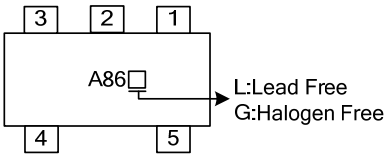
Ordering Number		Package	Packing
Lead Free Plating	Halogen Free		
U74AHC1G86L-AF5-R	U74AHC1G86G-AF5-R	SOT-25	Tape Reel
U74AHC1G86L-AL5-R	U74AHC1G86G-AL5-R	SOT-353	Tape Reel

U74AHC1G86L-AF5-R

(1)Packing Type
(2)Package Type
(3)Lead Free

(1) R: Tape Reel
(2) AF5: SOT-25, AL5: SOT-353
(3) L: Lead Free, G:Halogen Free

■ MARKING



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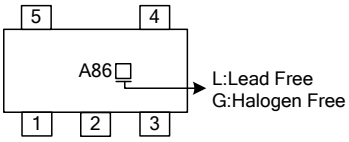

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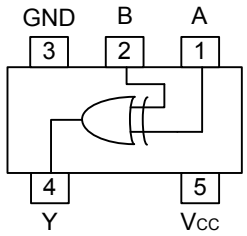
■ PIN CONFIGURATION



■ FUNCTION TABLE (Each Gate)

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

■ LOGIC DIAGRAM (Positive Logic)

■ ABSOLUTE MAXIMUM RATINGS (Note 1)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	-0.5~7	V
Input Voltage	V_{IN}	-0.5~7	V
Output Voltage	V_{OUT}	-0.5~V_{CC}+0.5	V
Input Clamp Current	I_{IK}	-20	mA
Output Clamp Current	I_{OK}	±20	mA
Output Current	I_{OUT}	±25	mA
V_{CC} or GND Current	I_{CC}	±50	mA
Storage Temperature	T_{STG}	-65 ~ +150	°C

Note 1. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.
2. 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	CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}		2		5.5	V
Input Voltage	V_{IN}		0		5.5	V
Output Voltage	V_{OUT}		0		V_{CC}	V
Input Transition Rise or Fall Rate	t_R, t_F	V_{CC}=3.3+0.3V			100	ns/V
		V_{CC}=5.0+0.5V			20	
Ambient Operating Temperature	T_{OPR}		-40		85	°C

■ STATIC CHARACTERISTICS (T_A=25°C)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-Level Input Voltage	V_{IH}	V_{CC}=2.0V	1.5			V
		V_{CC}=3.0V	2.1			
		V_{CC}=5.5V	3.85			
Low-Level Input Voltage	V_{IL}	V_{CC}=2.0V			0.5	V
		V_{CC}=3.0V			0.9	
		V_{CC}=5.5V			1.65	
High-Level Output Voltage	V_{OH}	V_{CC}=2.0V, I_{OH}=-50μA	1.9	2.0		V
		V_{CC}=3.0V, I_{OH}=-50μA	2.9	3.0		
		V_{CC}=4.5V, I_{OH}=-50μA	4.4	4.5		
		V_{CC}=3.0V, I_{OH}=-4mA	2.58			
		V_{CC}=4.5V, I_{OH}=-8mA	3.94			
Low-Level Output Voltage	V_{OL}	V_{CC}=2.0V, I_{OL}=50μA			0.1	V
		V_{CC}=3.0V, I_{OL}=50μA			0.1	
		V_{CC}=4.5V, I_{OL}=50μA			0.1	
		V_{CC}=3.0V, I_{OL} =4mA			0.36	
		V_{CC}=4.5V, I_{OL} =8mA			0.36	
Input Leakage Current	$I_{I(LEAK)}$	V_{CC}=0 ~ 5.5V, V_{IN}=V_{CC} or GND			±0.1	μA
Quiescent Supply Current	I_Q	V_{CC}=5.5V, V_{IN}=V_{CC} or GND, I_{OUT}=0			1	μA
Input Capacitance	C_{IN}	V_{CC}=5.0V, V_{IN}=V_{CC} or GND		4	10	pF

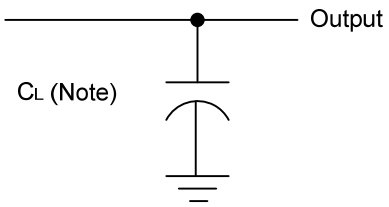
■ DYNAMIC CHARACTERISTICS (T_A=25°C, Input: t_R, t_F≤3ns; PRR≤1MHz)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from input (A and B) to output(Y)	t_{PLH}	V_{CC} =3.3V±0.3V, C_L=15pF		7	11	ns
	t_{PHL}			7	11	
	t_{PLH}	V_{CC} =3.3V±0.3V, C_L=50pF		9.5	14.5	
	t_{PHL}			9.5	14.5	
Propagation delay from input (A and B) to output(Y)	t_{PLH}	V_{CC} =5V±0.5V, C_L=15pF		4.8	6.8	ns
	t_{PHL}			4.8	6.8	
	t_{PLH}	V_{CC} =5V±0.5V, C_L=50pF		6.3	8.8	
	t_{PHL}			6.3	8.8	

■ OPERATING CHARACTERISTICS (T_A=25°C)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C_{PD}	No load, f=1MHz, V_{CC}=5V		18		pF

■ TEST CIRCUIT AND WAVEFORMS



Note: C_L includes probe and jig capacitance.