



## U74AHCT1G86

CMOS IC

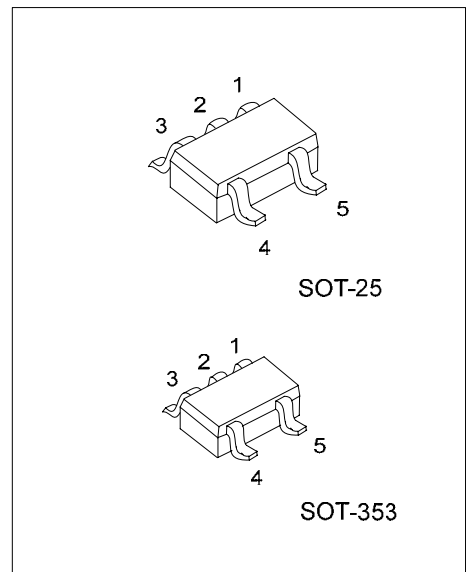
### 2-INPUT EXCLUSIVE-OR GATE

#### DESCRIPTION

The U74AHCT1G86 is a 2-input EXCLUSIVE-OR gate, it provides the Function  $Y=A \oplus B$ .

#### FEATURES

- \* Low Power Dissipation:  $I_{CC}=1.0\mu A(\text{Max})$
- \* High Speed:  $t_{pd}=5\text{ns}(\text{Typ})$
- \* High Noise Immunity

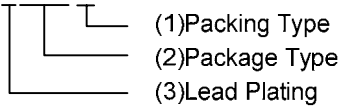


\*Pb-free plating product number:  
U74AHCT1G86L

#### ORDERING INFORMATION

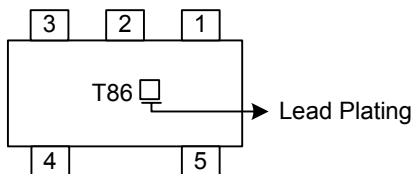
Ordering Number		Package	Packing
Normal	Lead Free Plating		
U74AHCT1G86-AF5-R	U74AHCT1G86L-AF5-R	SOT-25	Tape Reel
U74AHCT1G86-AL5-R	U74AHCT1G86L-AL5-R	SOT-353	Tape Reel

U74AHCT1G86L-AF5-R

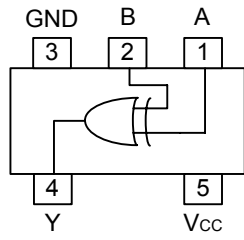


- (1) R: Tape Reel
- (2) AF5: SOT-25, AL5: SOT-353
- (3) L: Lead Free Plating, Blank: Pb/Sn

#### MARKING



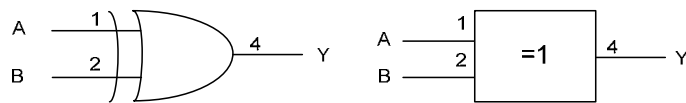
■ PIN CONFIGURATION



■ 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 (unless otherwise specified)(Note 1)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V <sub>CC</sub>	-0.5~7	V
Input Voltage	V <sub>IN</sub>	-0.5~7	V
Output Voltage	V <sub>OUT</sub>	-0.5~V <sub>CC</sub> +0.5	V
Input Clamp Current	I <sub>IK</sub>	-20	mA
Output Clamp Current	I <sub>OK</sub>	±20	mA
Output Current	I <sub>OUT</sub>	±25	mA
V <sub>CC</sub> or GND Current	I <sub>CC</sub>	±50	mA
Storage Temperature	T <sub>STG</sub>	-65 ~ +150	

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 <sub>CC</sub>		4.5		5.5	V
Input Voltage	V <sub>IN</sub>		0		5.5	V
Output Voltage	V <sub>OUT</sub>		0		V <sub>CC</sub>	V
Input Transition Rise or Fall Rate	t <sub>R</sub> , t <sub>F</sub>	V <sub>CC</sub> =5.0+0.5V			20	ns/V
Operating Temperature	T <sub>A</sub>		-40		85	

■ STATIC CHARACTERISTICS (T<sub>A</sub>=25 )

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-Level Input Voltage	V <sub>IH</sub>	V <sub>CC</sub> =4.5V~5.5V	2.0			V
Low-Level Input Voltage	V <sub>IL</sub>	V <sub>CC</sub> =4.5V~5.5V			0.8	V
High-Level Output Voltage	V <sub>OH</sub>	V <sub>CC</sub> =4.5V, I <sub>OH</sub> =-50μA	4.4	4.5		V
		V <sub>CC</sub> =4.5V, I <sub>OH</sub> =-8mA	3.94			
Low-Level Output Voltage	V <sub>OL</sub>	V <sub>CC</sub> =4.5V, I <sub>OL</sub> =50μA			0.1	V
		V <sub>CC</sub> =4.5V, I <sub>OL</sub> =8mA			0.36	
Input Leakage Current	I <sub>I(LEAK)</sub>	V <sub>CC</sub> =5.5V, V <sub>IN</sub> =V <sub>CC</sub> or GND			±0.1	μA
Quiescent Supply Current	I <sub>Q</sub>	V <sub>CC</sub> =5.5V, V <sub>IN</sub> =V <sub>CC</sub> or GND I <sub>OUT</sub> =0			1	μA
Additional Quiescent Supply Current	Δ I <sub>Q</sub>	V <sub>CC</sub> =5.5V, V <sub>IN</sub> =3.4V; other input at V <sub>CC</sub> or GND; I <sub>OUT</sub> =0			1.35	mA
Input Capacitance	C <sub>IN</sub>	V <sub>IN</sub> =V <sub>CC</sub> or GND		4	10	pF

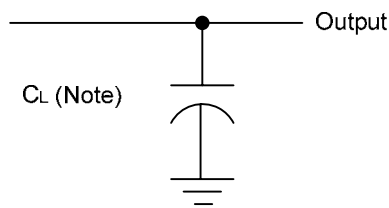
■ DYNAMIC CHARACTERISTICS (T<sub>A</sub>=25 , t<sub>R</sub>, t<sub>F</sub>≤3ns; PRR≤1MHz)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from input (A or B) to output(Y)	t <sub>PLH</sub>	V <sub>CC</sub> =5 ± 0.5V, C <sub>L</sub> =15pF		5	6.9	ns
	t <sub>PHL</sub>			5	6.9	
	t <sub>PLH</sub>	V <sub>CC</sub> =5 ± 0.5V, C <sub>L</sub> =50pF		5.5	7.9	
	t <sub>PHL</sub>			5.5	7.9	

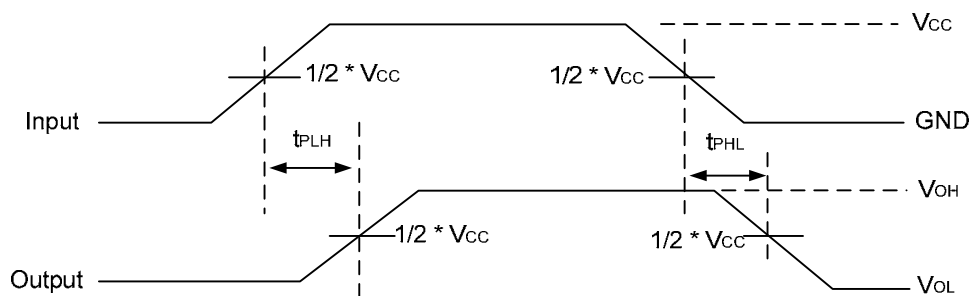
■ OPERATING CHARACTERISTICS (T<sub>A</sub>=25 )

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C <sub>pd</sub>	No load, f=1MHz, V <sub>CC</sub> =5V		18		pF

## ■ TEST CIRCUIT AND WAVEFORMS



Note:  $C_L$  includes probe and jig capacitance.



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