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# XC74UL86AA



## CMOS Logic

### CMOS 2-Input Exclusive-OR Gate

High Speed Operation :  $t_{pd} = 3.1\text{ns}$  (TYP.)

Operating Voltage Range : 2V ~ 5.5V

Low Power Consumption : 1  $\mu\text{A}$  (MAX.)

### APPLICATIONS

Palmtops

Digital equipment

### GENERAL DESCRIPTION

The XC74UL86AA is a 2-input CMOS exclusive-OR Gate, manufactured using silicon gate CMOS fabrication.

CMOS low power circuit operation makes high speed LS-TTL operation achievable.

With a wave forming buffer connected internally, stabilized output can be achieved as the circuit offers high noise immunity.

As the XC74UL86AA is integrated into mini molded, SSOT-25 and SOT-25 packages, high density mounting is possible.

### FEATURES

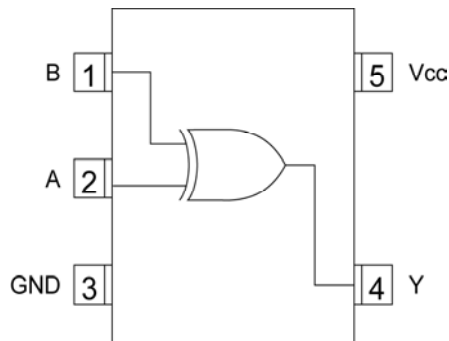
**High Speed Operation** :  $t_{pd} = 3.1\text{ns}$  (TYP.)

**Operating Voltage Range** : 2V ~ 5.5V

**Low Power Consumption**: 1  $\mu\text{A}$  (MAX.)

**Ultra Small Packages** : SSOT-25 and SOT-25

### PIN CONFIGURATION



SSOT-25/SOT-25  
(TOP VIEW)

### FUNCTIONS

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

H=High level

L=Low level

### ABSOLUTE MAXIMUM RATINGS

$T_a = -40 \sim 85$

PARAMETER	SYMBOL	RATINGS	UNITS
Supply Voltage	V <sub>CC</sub>	-0.5~+6.0	V
Input Voltage	V <sub>IN</sub>	-0.5~+6.0	V
Output Voltage	V <sub>OUT</sub>	-0.5~V <sub>CC</sub> +0.5	V
Input Diode Current	I <sub>IK</sub>	-20	mA
Output Diode Current	I <sub>OK</sub>	± 20	mA
Output Current	I <sub>OUT</sub>	± 25	mA
V <sub>CC</sub> ,GND Current	I <sub>CC</sub> ,I <sub>GND</sub>	± 50	mA
Power Dissipation( $T_a=55$ )	P <sub>d</sub>	150	mW
Storage Temperature Range	T <sub>stg</sub>	-65~+150	

\* Voltage is all ground standardized.

## RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	V <sub>CC</sub> (V)	CONDITIONS	UNITS
Supply Voltage	V <sub>CC</sub>	-	2~5.5	V
Input Voltage	V <sub>IN</sub>	-	0~5.5	V
Output Voltage	V <sub>OUT</sub>	-	0~V <sub>CC</sub>	V
Operating Temperature Range	T <sub>opr</sub>	-	-40~+85	
Output Current	I <sub>OH</sub>	3.0	-4	mA
		4.5	-8	
	I <sub>OL</sub>	3.0	4	
		4.5	8	
Input Rise and Fall Time	t <sub>r,tf</sub>	3.3	0~100	ns
		5.0	0~20	

## DC ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	V <sub>CC</sub> (V)	CONDITIONS	T <sub>a</sub> =25			T <sub>a</sub> =-40 ~85		UNITS	
				MIN.	TYP.	MAX.	MIN.	MAX.		
Input Voltage	V <sub>IH</sub>	2.0		1.5	-	-	1.5	-	V	
		3.0		2.1	-	-	2.1	-		
		5.5		3.85	-	-	3.85	-		
	V <sub>IL</sub>	2.0		-	-	0.5	-	0.5	V	
		3.0		-	-	0.9	-	0.9		
		5.5		-	-	1.65	-	1.65		
Output Voltage	V <sub>OH</sub>	2.0	V <sub>IN</sub> =V <sub>IH</sub> or V <sub>IL</sub>	I <sub>OH</sub> =-50 μA	1.9	2.0	-	1.9	-	V
		3.0			2.9	3.0	-	2.9	-	
		4.5		4.4	4.5	-	4.4	-		
		3.0		I <sub>OH</sub> =-4mA	2.58	-	-	2.48	-	
		4.5			I <sub>OH</sub> =-8mA	3.94	-	-	3.80	
	V <sub>OL</sub>	2.0	V <sub>IN</sub> =V <sub>IH</sub> or V <sub>IL</sub>	I <sub>OL</sub> =50 μA		-	-	0.1	-	0.1
		3.0			-	-	0.1	-	0.1	
		4.5		-	-	0.1	-	0.1		
		3.0		I <sub>OL</sub> =4mA	-	-	0.36	-	0.44	
		4.5			I <sub>OL</sub> =8mA	-	-	0.36	-	0.44
Input Current	I <sub>IN</sub>	5.5	V <sub>IN</sub> =V <sub>CC</sub> or GND	-0.1		-	0.1	-1.0	1.0	μA
Static Supply Current	I <sub>CC</sub>	5.5	V <sub>IN</sub> =V <sub>CC</sub> or GND, I <sub>OUT</sub> =0 μA	-	-	1.0	-	10.0		

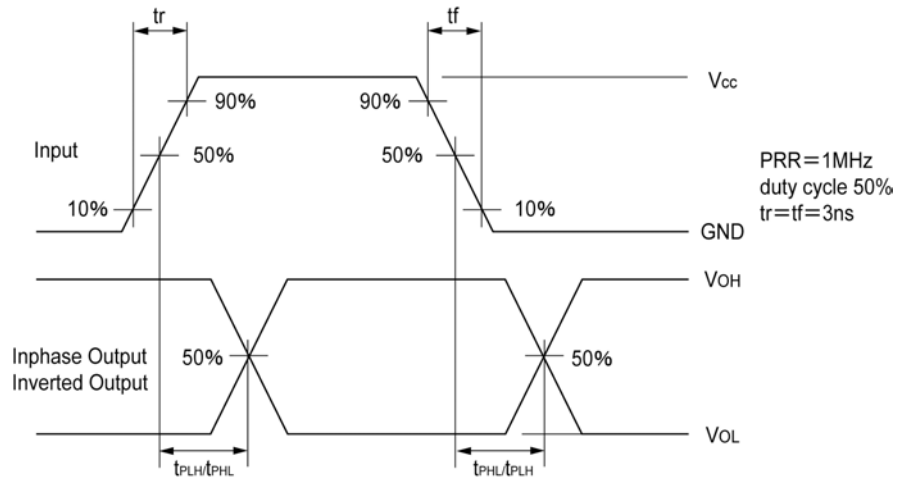
## SWITCHING ELECTRICAL CHARACTERISTICS

t<sub>r</sub>=t<sub>f</sub>=3ns

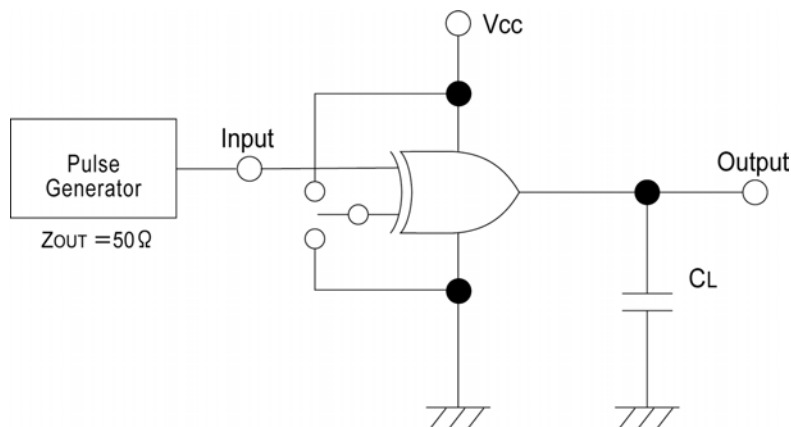
PARAMETER	SYMBOL	CONDITIONS		T <sub>a</sub> =25			T <sub>a</sub> =-40 ~85		UNITS	
		C <sub>L</sub>	V <sub>CC</sub> (V)	MIN.	TYP.	MAX.	MIN.	MAX.		
Delay Time	t <sub>PLH</sub>	15pF	3.3	-	4.4	11.0	1.0	13.0	ns	
			5.0	-	3.3	6.8	1.0	8.0		
		50pF	3.3	-	6.1	14.5	1.0	16.5	ns	
			5.0	-	4.4	8.8	1.0	10.0		
	t <sub>PHL</sub>	15pF	3.3	-	4.0	11.0	1.0	13.0	ns	
			5.0	-	2.9	6.8	1.0	8.0		
		50pF	3.3	-	5.6	14.5	1.0	16.5	ns	
			5.0	-	4.1	8.8	1.0	10.0		
Input Capacitance	C <sub>IN</sub>	-	5.0	V <sub>IN</sub> =V <sub>CC</sub> or GND	-	4	10	-	10	pF
Power Dissipation Capacitance	C <sub>pd</sub>	No Load, f=1MHz			-	12	-	-	-	pF

# XC74UL86AA

## WAVEFORM



## TEST CIRCUIT



Note: Open output when measuring supply current