

- ◆ COMS 2-Input NOR Gate
- ◆ High Speed Operation : tpd = 2.65ns TYP
- ◆ Operating Voltage Range : 2V ~ 5.5V
- ◆ Low Power Consumption : 1μA (max)

■ Applications

- Palmtops
- Digital Equipment

■ General Description

The ML74UL02MRG is a 2-input CMOS NOR gate, manufactured using silicon gate CMOS fabrication.

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

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

AS the ML74UL02MRG is integrated into mini molded, SOT-23-5 package, high density mounting possible.

■ Features

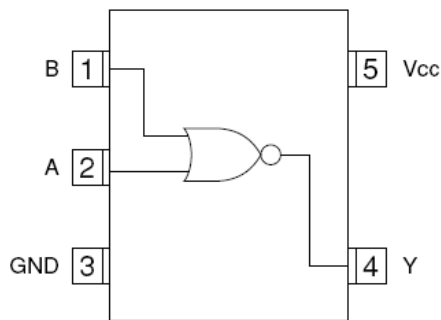
High Speed Operation : tpd = 2.6ns TYP

Operating Voltage Range: 2V ~ 5.5V

Low Power Consumption: 1μA (max)

Ultra Small Package : SOT-23-5

■ Pin Configuration



SOT-23-5 (TOP VIEW)

■ Function

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

H=High level, L=Low level

■ Absolute Maximum Ratings

Ta=-40°C~85°C

PARAMETER	SYMBOL	RATINGS	UNITS
Power Supply Voltage	Vcc	-0.5 ~ +6.0	V
Input voltage	VIN	-0.5 ~ +6.0	V
Output Voltage	VOUT	-0.5 ~ Vcc +0.5	V
Input Diode Current	I _{IK}	±20	mA
Output Diode current	I _{OK}	±20	mA
Output Current	I _{OUT}	±25	mA
Vcc, GND Current	I _{CC} , I _{GND}	±50	mA
Continuous Total Power Dissipation (Ta=55°C)	Pd	150	mW
Storage Temperature	T _{stg}	-65 ~ +150	°C

Note: Voltage is all Ground standardized.

■ Recommended Operating Conditions

PARAMETER	SYMBOL	V _{cc} (V)	CONDITIONS	UNITS
Supply Voltage	V _{cc}	-	2 ~ 5.5	V
Input Voltage	V _{IN}	-	0 ~ 5.5	V
Output Voltage	V _{OUT}	-	0 ~ V _{cc}	V
Operating Temperature	T _{opr}	-	-40 ~ +85	°C
Output Current	I _{OH}	3.0	-4	mA
		4.5	-8	
	I _{OL}	3.0	4	
		4.5	8	
Input Rise and Fall Time	tr, tf	3.3	0 ~ 100	ns
		5.0	0 ~ 20	

■ DC Electrical Characteristics

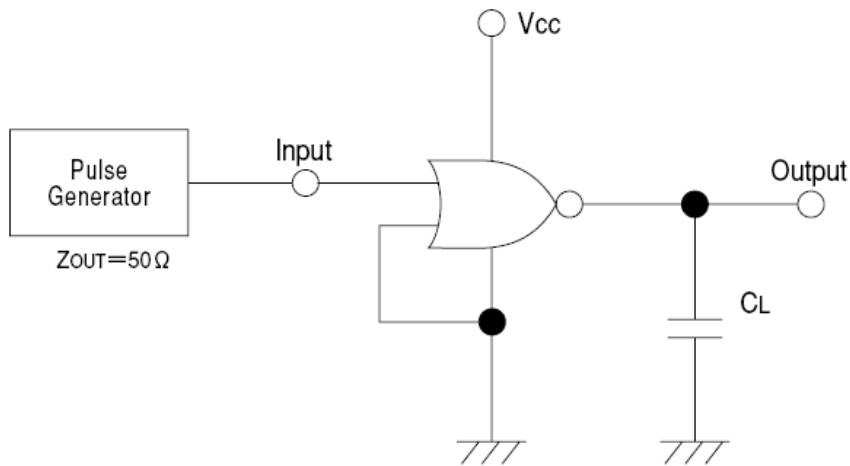
PARAMETER	SYMBOL	V _{cc} (V)	CONDITIONS	Ta=25°C			Ta=-40~85°C		UNITS		
				MIN	TYP	MAX	MIN	MAX			
Input Voltage	V _{IH}	2.0		1.5	-	-	1.5	-	V		
		3.0		2.1	-	-	2.1	-			
		5.5		3.85	-	-	3.85	-			
	V _{IL}	2.0		-	-	0.5	-	0.5	V		
		3.0		-	-	0.9	-	0.9			
		5.5		-	-	1.65	-	1.65			
Output Voltage	V _{OH}	2.0	V _{IN} =V _{IH} or V _{IL}	I _{OH} =-50μA	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 _{OH} =-4mA	2.58	-	-	2.48	-		
		4.5		I _{OH} =-8mA	3.94	-	-	3.80	-		
	V _{OL}	V _{IN} =V _{IH}	2.0	I _{OL} =50μA	-	-	0.1	-	0.1	V	
					3.0	-	-	0.1	-		0.1
					4.5	-	-	0.1	-		0.1
			3.0		I _{OL} =4mA	-	-	0.36	-		0.44
			4.5		I _{OL} =8mA	-	-	0.36	-		0.44
Input Current	I _{IN}	5.5	V _{IN} =V _{cc} or GND	-0.1	-	0.1	-1.0	1.0	μA		
Quiescent Supply Current	I _{cc}	5.5	V _{IN} =V _{cc} or GND, I _{OUT} =0μA	-	-	1.0	-	10.0	μA		

■ Switching Electrical Characteristics

PARAMETER	SYMBOL	C _L	V _{cc} (V)	CONDITIONS	Ta=25°C			Ta=-40~85°C		UNITS
					MIN	TYP	MAX	MIN	MAX	
Propagation Delay Time	t _{PLH}	15pF	3.3		-	3.9	7.9	1.0	9.5	ns
			5.0		-	2.7	5.5	1.0	6.5	
		50pF	3.3		-	5.5	11.4	1.0	13	ns
			5.0		-	3.9	7.5	1.0	8.5	
	t _{PHL}	15pF	3.3		-	3.5	7.9	1.0	9.5	ns
			5.0		-	2.6	5.5	1.0	6.5	
		50pF	3.3		-	4.9	11.4	1.0	13	ns
			5.0		-	3.6	7.5	1.0	8.5	
Input Capacitance	C _{IN}	-	5.0	V _{IN} =V _{cc} or GND	-	4	10	-	10	pF
Power Dissipation Capacitance	C _{pd}	No Load, f=1MHz			-	9.7	-	-	-	pF

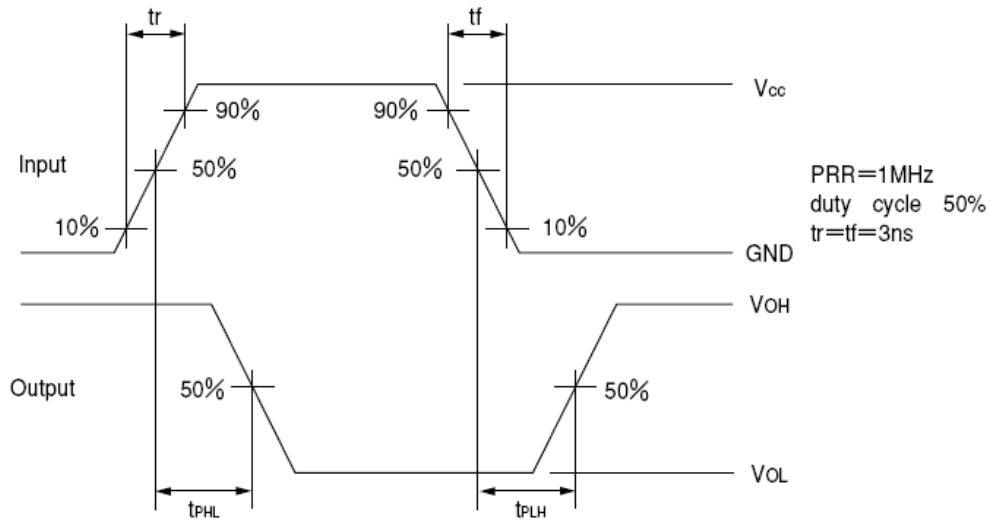
Tr=tf=3ns

■ Typical Application Circuit



Note: Open output when measuring supply current

■ Waveforms



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