



## U74AHC1G04

CMOS IC

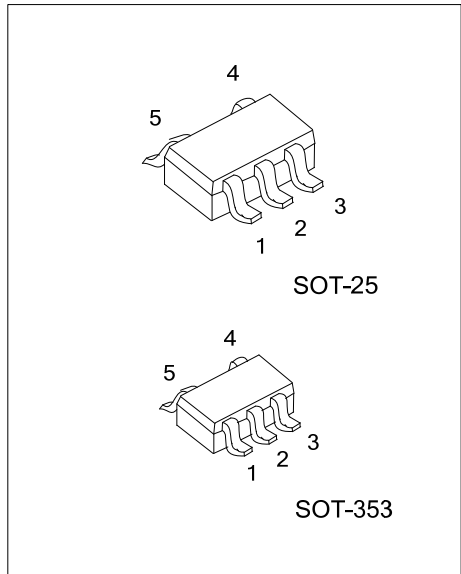
### SINGLE INVERTER GATE

#### DESCRIPTION

The **U74AHC1G04** is a inverter gate, it provides the Function  $Y = \bar{A}$

#### FEATURES

- \* Operation Voltage Range: 2V~5.5V
- \* Low Power Current:  $I_{CC}=10\mu A(\text{Max})$
- \* High Speed:  $t_{PD}=6.5\text{ns}(\text{Typ})$

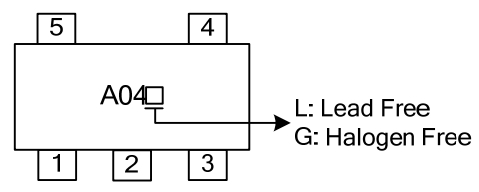


#### ORDERING INFORMATION

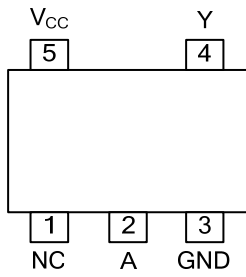
Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74AHC1G04L-AF5-R	U74AHC1G04G-AF5-R	SOT-25	Tape Reel
U74AHC1G04L-AL5-R	U74AHC1G04G-AL5-R	SOT-353	Tape Reel

<p>U74AHC1G04L-AF5-R</p> <p>(1) Packing Type (2) Package Type (3) Lead Free</p>	<p>(1) R: Tape Reel (2) AF5: SOT-25, AL5: SOT-353 (3) G: Halogen Free, L: Lead Free</p>
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#### MARKING



## ■ PIN CONFIGURATION

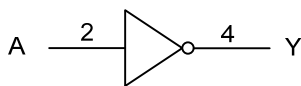


## ■ FUNCTION TABLE

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

Note: H: high voltage level; L: low voltage level.

## ■ LOGIC DIAGRAM



### ■ ABSOLUTE MAXIMUM RATING (unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	$V_{CC}$	-0.5~+7.0	V
Input Voltage (Note 2)	$V_{IN}$	-0.5~+7.0	V
Output Voltage (Note 2)	$V_{OUT}$	-0.5~ $V_{CC}+0.5$	V
$V_{CC}$ or GND Current	$I_{CC}$	±50	mA
Output Current	$I_{OUT}$	±25	mA
Input Clamp Current	$I_{IK}$	-20	mA
Output Clamp Current	$I_{OK}$	±20	mA
Operating Temperature	$T_{OPR}$	-40 ~ +85	°C
Storage Temperature	$T_{STG}$	-65 ~ +150	°C

Note: 1. 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.

2. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

### ■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	$\theta_{JA}$	200	°C/W
		250	

### ■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	TEST 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
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 Current	$I_{OH}$	$V_{CC}=2.0V$			-50	μA
		$V_{CC}=3.3V\pm 0.3V$			-4	mA
		$V_{CC}=5.0V\pm 0.5V$			-8	
Low-Level Output Current	$I_{OL}$	$V_{CC}=2.0V$			50	μA
		$V_{CC}=3.3V\pm 0.3V$			4	mA
		$V_{CC}=5.0V\pm 0.5V$			8	
Input Transition Rise or Fall Rate	$t_R, t_F$	$V_{CC}=3.3V\pm 0.3V$			100	ns/V
		$V_{CC}=5.0V\pm 0.5V$			20	

## ■ ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-Level Output Voltage	V <sub>OH</sub>	V <sub>CC</sub> =2.0V, I <sub>OH</sub> =-50μA	1.9	2.0		V
		V <sub>CC</sub> =3.0V, I <sub>OH</sub> =-50μA	2.9	3.0		
		V <sub>CC</sub> =4.5V, I <sub>OH</sub> =-50μA	4.4	4.5		
		V <sub>CC</sub> =3.0V, I <sub>OH</sub> =-4mA	2.58			
		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> =2.0V, I <sub>OH</sub> =50μA			0.1	V
		V <sub>CC</sub> =3.0V, I <sub>OH</sub> =50μA			0.1	
		V <sub>CC</sub> =4.5V, I <sub>OH</sub> =50μA			0.1	
		V <sub>CC</sub> =3.0V, I <sub>OH</sub> =4mA			0.36	
		V <sub>CC</sub> =4.5V, I <sub>OH</sub> =8mA			0.36	
Input Leakage Current	I <sub>I(LEAK)</sub>	V <sub>CC</sub> =0V~5.5V, V <sub>IN</sub> =5.5V 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> =0A			1	μA
Input Capacitance	C <sub>I</sub>	V <sub>IN</sub> =V <sub>CC</sub> or GND		2	10	pF

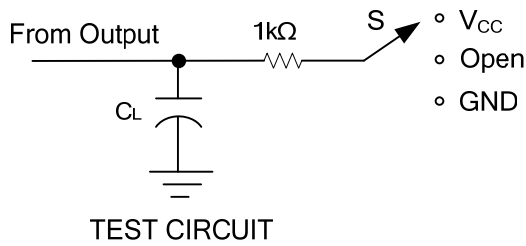
## ■ DYNAMIC CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation Delay Time Input(A) to Output(Y)	t <sub>PLH</sub>	V <sub>CC</sub> =3.3V±0.3V, C <sub>L</sub> =15pF		5	7.1	ns
	t <sub>PHL</sub>			5	7.1	
	t <sub>PLH</sub>	V <sub>CC</sub> =3.3V±0.3V, C <sub>L</sub> =50pF		7.5	10.6	
	t <sub>PHL</sub>			7.5	10.6	
Propagation Delay Time Input(A) to Output(Y)	t <sub>PLH</sub>	V <sub>CC</sub> =5V±0.5V, C <sub>L</sub> =15pF		3.8	5.5	ns
	t <sub>PHL</sub>			3.8	5.5	
	t <sub>PLH</sub>	V <sub>CC</sub> =5V±0.5V, C <sub>L</sub> =50pF		5.3	7.5	
	t <sub>PHL</sub>			5.3	7.5	

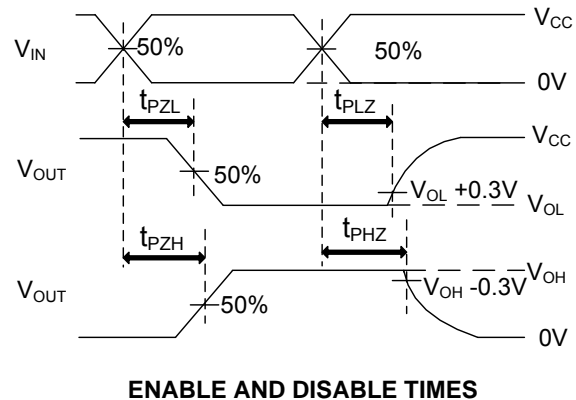
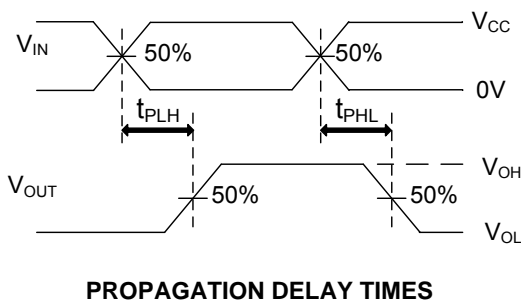
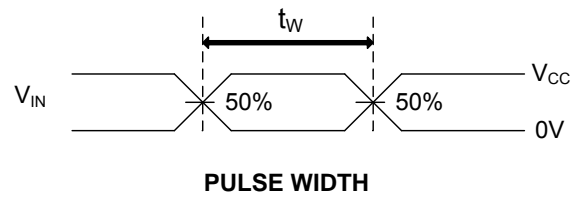
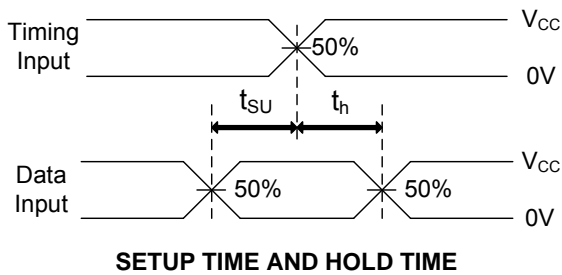
## ■ OPERATING CHARACTERISTICS (T<sub>A</sub>=25°C)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C <sub>PD</sub>	No load, V <sub>CC</sub> =5V, f=1MHz		12		pF

## ■ TEST CIRCUIT AND WAVEFORMS



TEST	S
$t_{PLH}/t_{PHL}$	Open
$t_{PHZ}/t_{PZH}$	GND
$t_{PLZ}/t_{PZL}$	$V_{CC}$



Note:  $C_L$  includes probe and jig capacitance.  
 $P_{RR} \cong 1\text{MHz}$ ,  $Z_0=50\Omega$ ,  $t_R \cong 3\text{ns}$ ,  $t_F \cong 3\text{ns}$

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