



U74AHC3G04

CMOS IC

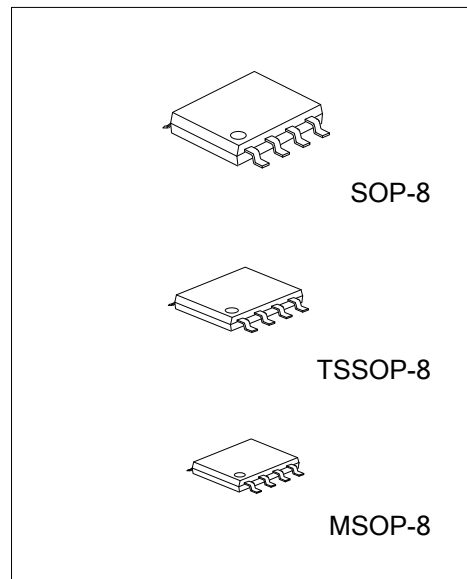
INVERTER

DESCRIPTION

The **U74AHC3G04** are high-speed Si-gate CMOS devices providing three inverting buffers with the function $Y = \bar{A}$.

FEATURES

- * Low Power Dissipation
- * Symmetrical Output Impedance
- * Balanced Propagation Delays
- * High Noise Immunity



ORDERING INFORMATION

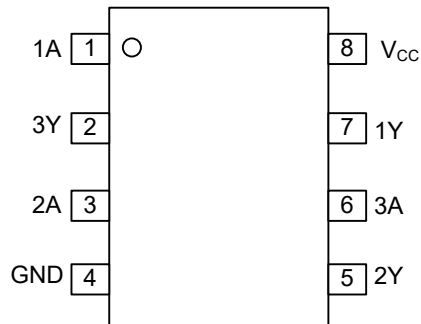
Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74AHC3G04L-P08-R	U74AHC3G04G-P08-R	TSSOP-8	Tape Reel
U74AHC3G04L-S08-R	U74AHC3G04G-S08-R	SOP-8	Tape Reel
U74AHC3G04L-SM1-R	U74AHC3G04G-SM1-R	MSOP-8	Tape Reel

<p>U74AHC3G04G-P08-R</p> <p>(1) Packing Type (2) Package Type (3) Green Package</p>	<p>(1) R: Tape Reel (2) P08: TSSOP-8, S08: SOP-8, SM1:MSOP-8 (3) G: Halogen Free and Lead Free, L: Lead Free</p>
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MARKING

SOP-8 / MSOP-8	TSSOP-8
<p>UTC □□□□ → Date Code AHC3G04 □ → L: Lead Free □ → G: Halogen Free ● □□ → Lot Code</p>	<p>UTC □□□□ → Date Code AHC3G04 □ → L: Lead Free □ → G: Halogen Free ● □□ → Lot Code</p>

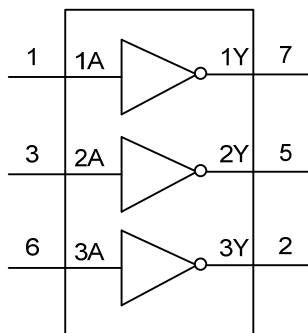
■ PIN CONFIGURATION



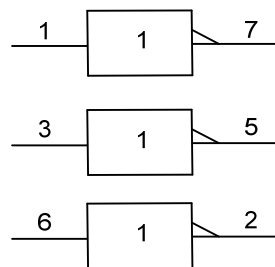
■ FUNCTION TABLE (each gate)

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

■ LOGIC DIAGRAM (each gate)



Logic symbol



IEC logic symbol

■ ABSOLUTE MAXIMUM RATING (Unless otherwise specified)

PARAMETER	SYMBOL	CONDITIONS	RATINGS	UNIT
Supply Voltage	V_{CC}		-0.5 ~ 7.0	V
Input Voltage	V_{IN}		-0.5 ~ 7.0	V
Output Voltage	V_{OUT}		-0.5 ~ $V_{CC} + 0.5$	V
V_{CC} or GND Current	I_{CC}		±75	mA
Output Current	I_{OUT}	$-0.5V < V_{OUT} < V_{CC} + 0.5V$	±25	mA
Input Clamp Current	I_{IK}	$V_{IN} < -0.5V$	-20	mA
Output Clamp Current	I_{OK}	$V_{OUT} < -0.5V$ or $V_{OUT} > + 0.5V$	±20	mA
Storage Temperature	T_{STG}		-65 ~ + 150	°C

Note: 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 (Unless otherwise specified)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}		2.0	5.0	5.5	V
Input Voltage	V_{IN}		0		5.5	V
Output Voltage	V_{OUT}		0		V_{CC}	V
Input Rise or Fall Times	$\Delta t/\Delta V$	$V_{CC} = 3.3 \pm 0.3V$			100	ns/V
		$V_{CC} = 5.0 \pm 0.5V$			20	
Operating Temperature	T_A		-40		+125	°C

■ ELECTRICAL CHARACTERISTICS (Unless otherwise specified)

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}	$V_{CC}=2.0V, V_{IN}=V_{IH}$ or $V_{IL}, I_{OH}=-50\mu A$	1.9	2.0		V
		$V_{CC}=3.0V, V_{IN}=V_{IH}$ or $V_{IL}, I_{OH}=-50\mu A$	2.9	3.0		
		$V_{CC}=4.5V, V_{IN}=V_{IH}$ or $V_{IL}, I_{OH}=-50\mu A$	4.4	4.5		
		$V_{CC}=3.0V, V_{IN}=V_{IH}$ or $V_{IL}, I_{OH}=-4.0mA$	2.58			
		$V_{CC}=4.5V, V_{IN}=V_{IH}$ or $V_{IL}, I_{OH}=-8.0mA$	3.94			
Low-Level Output Voltage	V_{OL}	$V_{CC}=2.0V, V_{IN}=V_{IH}$ or $V_{IL}, I_{OL}=50\mu A$			0.1	V
		$V_{CC}=3.0V, V_{IN}=V_{IH}$ or $V_{IL}, I_{OL}=50\mu A$			0.1	
		$V_{CC}=4.5V, V_{IN}=V_{IH}$ or $V_{IL}, I_{OL}=50\mu A$			0.1	
		$V_{CC}=3.0V, V_{IN}=V_{IH}$ or $V_{IL}, I_{OL}=4.0mA$			0.36	
		$V_{CC}=4.5V, V_{IN}=V_{IH}$ or $V_{IL}, I_{OL}=8.0mA$			0.36	
Input Leakage Current	$I_{I(LEAK)}$	$V_{CC}=5.5V, V_{IN}=V_{CC}$ or GND			0.1	μA
Quiescent Supply Current	I_{CC}	$V_{CC}=5.5V, V_{IN}=V_{CC}$ or GND, $I_{OUT}=0$			10	μA
Input Capacitance	C_{IN}	$V_{IN}=V_{CC}$ or GND		1.5	10	pF

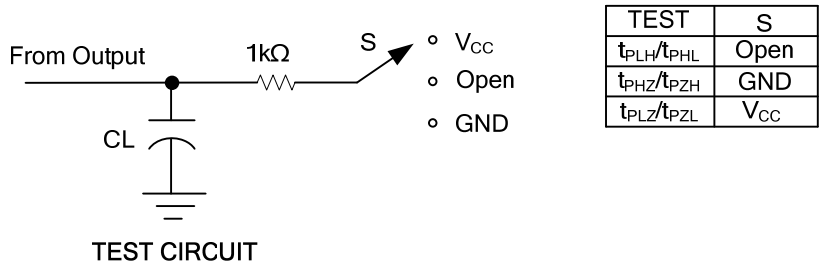
■ SWITCHING CHARACTERISTICS ($t_R = t_F \leq 3.0$ ns, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT		
Propagation delay from input (A) to output(Y)	t_{PLH} / t_{PHL}	$C_L=15\text{pF}$	$V_{CC}=3.0 \sim 3.6\text{V}$			7.1	ns	
			$V_{CC}=3.3\text{V}$		4.3		ns	
			$V_{CC}=4.5 \sim 5.5\text{V}$			5.5	ns	
			$V_{CC}=5\text{V}$		3.1		ns	
		$C_L=50\text{pF}$	$V_{CC}=3.0 \sim 3.6\text{V}$				10.6	ns
			$V_{CC}=3.3\text{V}$			6.1		ns
			$V_{CC}=4.5 \sim 5.5\text{V}$				7.5	ns
			$V_{CC}=5\text{V}$			4.5	-	ns

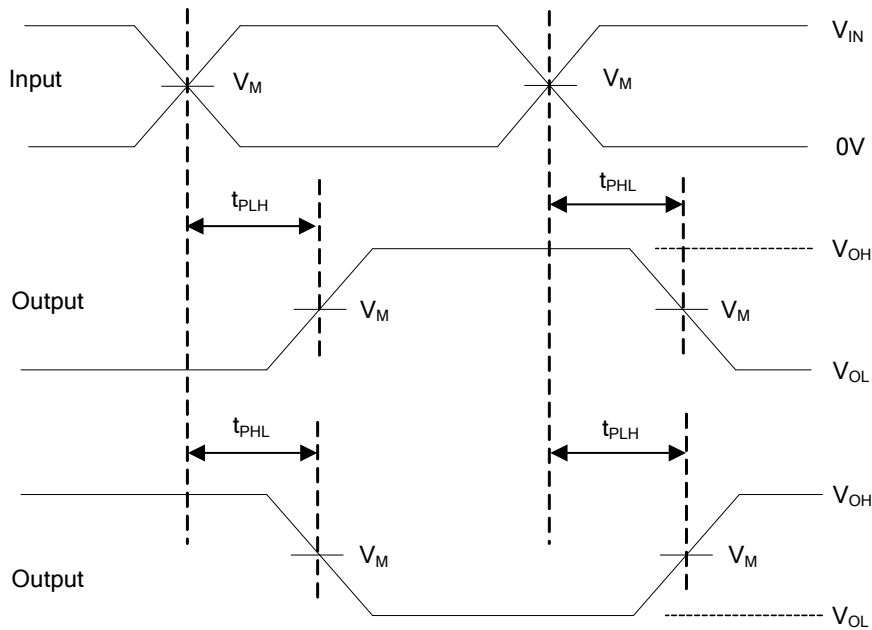
■ OPERATING CHARACTERISTICS (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C_{PD}	$C_L=50\text{pF}$, $f=1\text{MHz}$, $V_{IN}=\text{GND}$ or V_{CC}		9		pF

■ TEST CIRCUIT AND WAVEFORMS



V_I INPUT REQUIREMENTS	V_M INPUT	V_M OUTPUT
GND to V_{CC}	$50\%V_{CC}$	$50\%V_{CC}$



**Propagation delay times
Inverting and noninverting outputs**

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

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