



## U74AHC1G08

CMOS IC

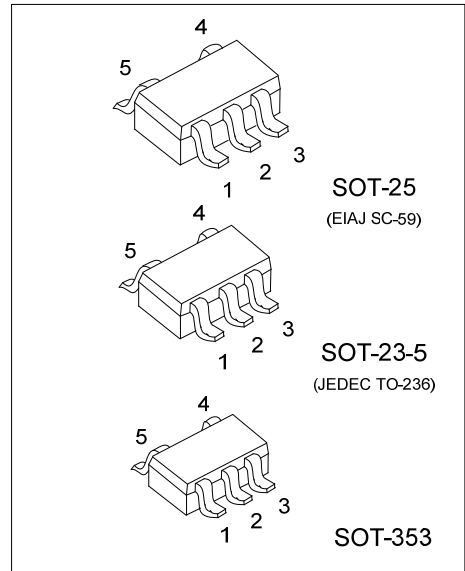
### 2-INPUT AND GATE

#### DESCRIPTION

The UTC **U74AHC1G08** is a high-speed si-gate CMOS device which provides the 2-input AND function.

#### FEATURES

- \* Operation Voltage Range: 2~5.5V
- \* Low Power Current:  $I_{CC}=10\mu A(\text{Max})$
- \* High speed:  $t_{PD}=4.3\text{ns}(\text{Typ}) @ V_{CC} =5V$

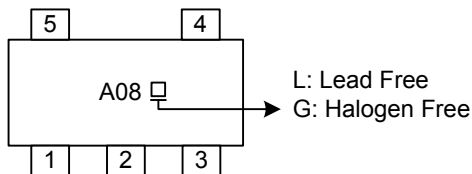


#### ORDERING INFORMATION

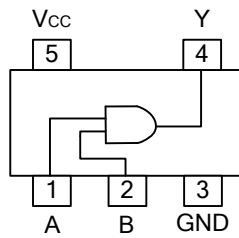
Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74AHC1G08L-AE5-R	U74AHC1G08G-AE5-R	SOT-23-5	Tape Reel
U74AHC1G08L-AF5-R	U74AHC1G08G-AF5-R	SOT-25	Tape Reel
U74AHC1G08L-AL5-R	U74AHC1G08G-AL5-R	SOT-353	Tape Reel

<p>U74AHC1G08G-AE5-R</p> <p>(1) Packing Type (2) Package Type (3) Green Package</p>	<p>(1) R: Tape Reel (2) AE5: SOT-23-5, AF5: SOT-25, AL5: SOT-353 (3) G: Halogen Free and Lead Free, L: Lead Free</p>
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#### MARKING



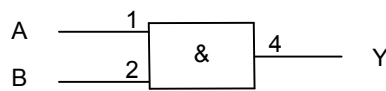
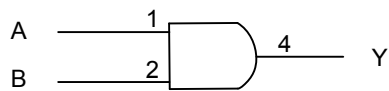
■ PIN CONFIGURATION



■ FUNCTION TABLE (each gate)

INPUTS		OUTPUT
A	B	Y
L	L	L
L	H	L
H	L	L
H	H	H

■ LOGIC DIAGRAM (positive logic)



IEC logic symbol

■ ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub> =25°C, unless otherwise specified)

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
Power Dissipation	P <sub>D</sub>	250	mW
Storage Temperature	T <sub>STG</sub>	-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

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
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
Input Transition Rise or Fall Times	t <sub>R</sub> , t <sub>F</sub>	V <sub>CC</sub> =3.3V±0.3V			100	ns/V
		V <sub>CC</sub> =5.0V±0.5V			20	
Operating Temperature	T <sub>OPR</sub>		-40		125	°C

■ STATIC CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-Level Input Voltage	V <sub>IH</sub>	V <sub>CC</sub> =2.0V	1.5			V
		V <sub>CC</sub> =3.0V	2.1			V
		V <sub>CC</sub> =5.5V	3.85			V
Low-Level Input Voltage	V <sub>IL</sub>	V <sub>CC</sub> =2.0V			0.5	V
		V <sub>CC</sub> =3.0V			0.9	V
		V <sub>CC</sub> =5.5V			1.65	V
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
		V <sub>CC</sub> =4.5V, I <sub>OH</sub> =-50μA	4.4	4.5		V
		V <sub>CC</sub> =3.0V, I <sub>OH</sub> =-4mA	2.58			V
		V <sub>CC</sub> =4.5V, I <sub>OH</sub> =-8mA	3.94			V
Low-Level Output Voltage	V <sub>OL</sub>	V <sub>CC</sub> =2.0V, I <sub>OL</sub> =50μA			0.1	V
		V <sub>CC</sub> =3.0V, I <sub>OL</sub> =50μA			0.1	V
		V <sub>CC</sub> =4.5V, I <sub>OL</sub> =50μA			0.1	V
		V <sub>CC</sub> =3.0V, I <sub>OL</sub> =4mA			0.36	V
		V <sub>CC</sub> =4.5V, I <sub>OL</sub> =8mA			0.36	V
Input Leakage Current	I <sub>I(LEAK)</sub>	V <sub>CC</sub> =0~5.5V, 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
Input Capacitance	C <sub>IN</sub>	V <sub>CC</sub> =5V, V <sub>IN</sub> =V <sub>CC</sub> or GND		4	10	pF

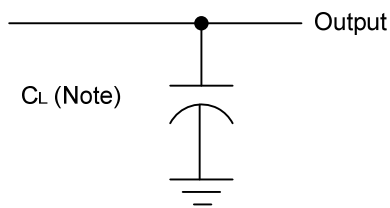
■ DYNAMIC CHARACTERISTICS ( $T_A=25^\circ\text{C}$ , Input:  $t_R, t_F \leq 3\text{ns}$ ;  $P_{RR} \leq 1\text{MHz}$ )

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay time Input (A or B) to output(Y)	$t_{PLH}$	$V_{CC}=3.3V \pm 0.3V, C_L=15\text{pF}$		6.2	8.8	ns
	$t_{PHL}$			6.2	8.8	ns
	$t_{PLH}$	$V_{CC}=3.3V \pm 0.3V, C_L=50\text{pF}$		8.7	12.3	ns
	$t_{PHL}$			8.7	12.3	ns
Propagation delay time Input (A or B) to output(Y)	$t_{PLH}$	$V_{CC}=5V \pm 0.5V, C_L=15\text{pF}$		4.3	5.9	ns
	$t_{PHL}$			4.3	5.9	ns
	$t_{PLH}$	$V_{CC}=5V \pm 0.5V, C_L=50\text{pF}$		5.8	7.9	ns
	$t_{PHL}$			5.8	7.9	ns

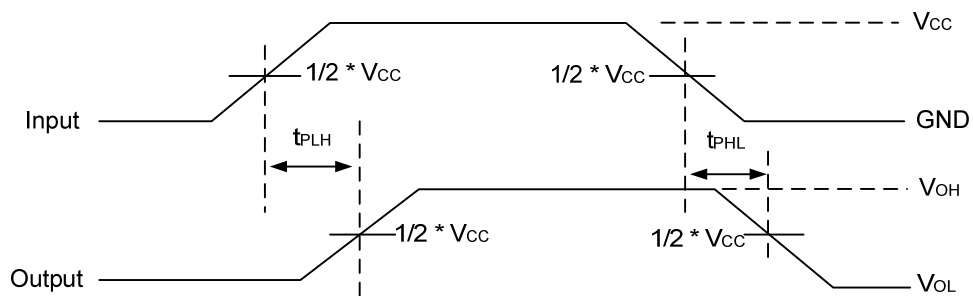
■ OPERATING CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	$C_{PD}$	No load, $V_{CC}=5V, f=1\text{MHz}$		18		pF

■ TEST CIRCUIT AND WAVEFORMS



Note:  $C_L$  includes probe and jig capacitance.



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