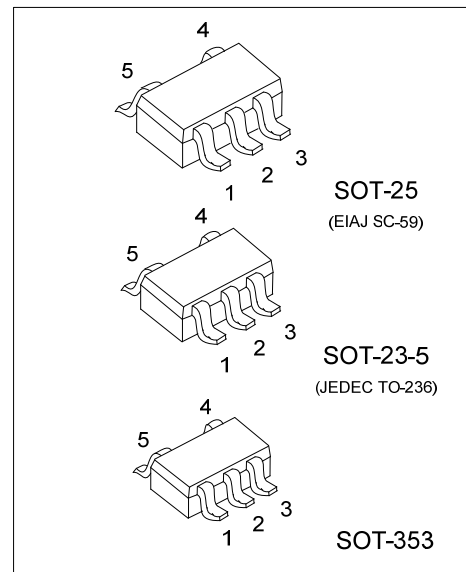


**U74AHC1G08****CMOS IC****2-INPUT AND GATE****DESCRIPTION**

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

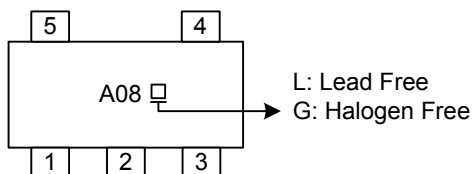
FEATURES

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

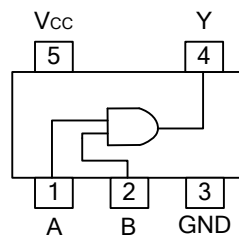
**ORDERING INFORMATION**

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

U74AHC1G08G-AE5-R	(1)Packing Type (2)Package Type (3)Green Package	(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
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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** ($T_A = 25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	-0.5~7	V
Input Voltage	V_{IN}	-0.5~7	V
Output Voltage	V_{OUT}	-0.5~ $V_{CC}+0.5$	V
Input Clamp Current	I_{IK}	-20	mA
Output Clamp Current	I_{OK}	± 20	mA
Output Current	I_{OUT}	± 25	mA
V_{CC} or GND Current	I_{CC}	± 50	mA
Power Dissipation	P_D	250	mW
Storage Temperature	T_{STG}	-65 ~ +150	$^\circ\text{C}$

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_{CC}		2		5.5	V
Input Voltage	V_{IN}		0		5.5	V
Output Voltage	V_{OUT}		0		V_{CC}	V
Input Transition Rise or Fall Times	t_R, t_F	$V_{CC}=3.3V \pm 0.3V$			100	ns/V
		$V_{CC}=5.0V \pm 0.5V$			20	
Operating Temperature	T_{OPR}		-40		125	$^\circ\text{C}$

■ **STATIC CHARACTERISTICS**

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
		$V_{CC}=5.5V$	3.85			V
Low-Level Input Voltage	V_{IL}	$V_{CC}=2.0V$			0.5	V
		$V_{CC}=3.0V$			0.9	V
		$V_{CC}=5.5V$			1.65	V
High-Level Output Voltage	V_{OH}	$V_{CC}=2.0V, I_{OH}=-50\mu A$	1.9	2.0		V
		$V_{CC}=3.0V, I_{OH}=-50\mu A$	2.9	3.0		V
		$V_{CC}=4.5V, I_{OH}=-50\mu A$	4.4	4.5		V
		$V_{CC}=3.0V, I_{OH}=-4mA$	2.58			V
		$V_{CC}=4.5V, I_{OH}=-8mA$	3.94			V
Low-Level Output Voltage	V_{OL}	$V_{CC}=2.0V, I_{OL}=50\mu A$			0.1	V
		$V_{CC}=3.0V, I_{OL}=50\mu A$			0.1	V
		$V_{CC}=4.5V, I_{OL}=50\mu A$			0.1	V
		$V_{CC}=3.0V, I_{OL}=4mA$			0.36	V
		$V_{CC}=4.5V, I_{OL}=8mA$			0.36	V
Input Leakage Current	$I_{I(LEAK)}$	$V_{CC}=0\sim 5.5V, V_{IN}=V_{CC}$ or GND			± 0.1	μA
Quiescent Supply Current	I_Q	$V_{CC}=5.5V, V_{IN}=V_{CC}$ or GND, $I_{OUT}=0$			1	μA
Input Capacitance	C_{IN}	$V_{CC}=5V, V_{IN}=V_{CC}$ or GND		4	10	pF

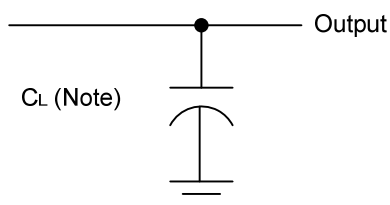
■ **DYNAMIC CHARACTERISTICS** ($T_A=25^\circ\text{C}$, Input: $t_R, t_F \leq 3\text{ns}$; $P_{RR} \leq 1\text{MHz}$)

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

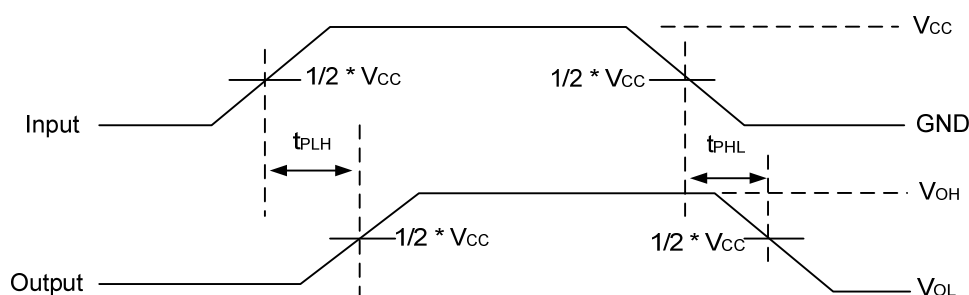
■ **OPERATING CHARACTERISTICS** ($T_A=25^\circ\text{C}$, unless otherwise specified)

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: CL includes probe and jig capacitance.



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