



U74HC2G08

CMOS IC

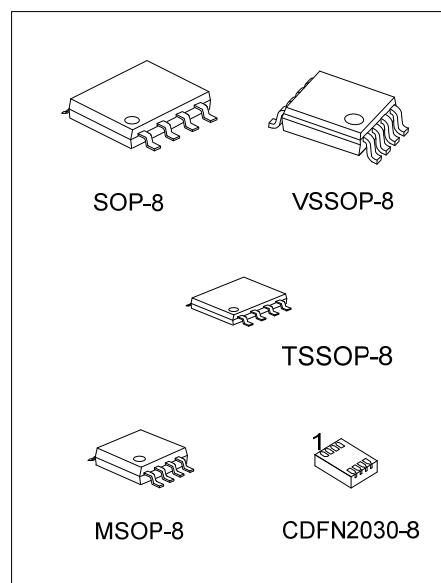
2-INPUT AND GATE

DESCRIPTION

The **U74HC2G08** is a 2-input AND gate which provides the Function $Y=A \times B$.

FEATURES

- * Operation voltage range: 2.0V~6.0V
- * Low power dissipation: $I_{CC}=10\mu A$ (Max.)
- * High speed: $t_{PD}=19ns$ (Max.) ($V_{CC}=4.5V$, $C_L=50pF$)



ORDERING INFORMATION

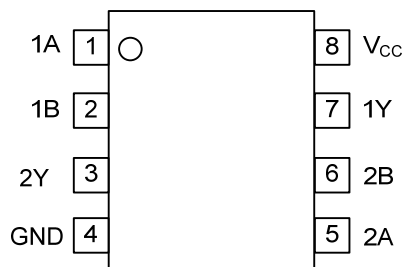
Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74HC2G08L-S08-R	U74HC2G08G-S08-R	SOP-8	Tape Reel
U74HC2G08L-SM1-R	U74HC2G08G-SM1-R	MSOP-8	Tape Reel
U74HC2G08L-P08-R	U74HC2G08G-P08-R	TSSOP-8	Tape Reel
U74HC2G08L-V08-R	U74HC2G08G-V08-R	VSSOP-8	Tape Reel
U74HC2G08L-CK08-2030-R	U74HC2G08G-CK08-2030-R	CDFN2030-8	Tape Reel

U74HC2G08G-S08-R (1) Packing Type (2) Package Type (3) Green Package	(1) R: Tape Reel (2) S08: SOP-8, SM1: MSOP-8, P08: TSSOP-8 V08: VSSOP-8, CK08-2030: CDFN2030-8 (3) G: Halogen Free and Lead Free, L: Lead Free
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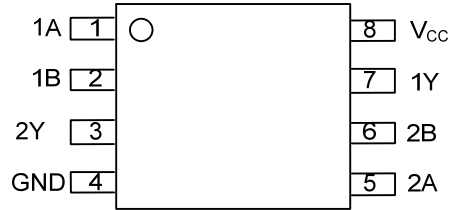
MARKING

SOP-8 / MSOP-8	TSSOP-8
Date Code L: Lead Free G: Halogen Free Lot Code	Date Code L: Lead Free G: Halogen Free Lot Code
VSSOP-8	CDFN2030-8
Date Code L: Lead Free G: Halogen Free Lot Code	HC 2G08 Date Code

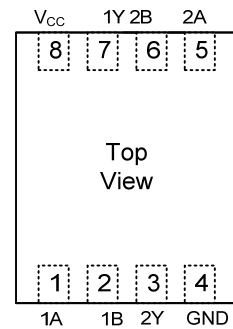
PIN CONFIGURATION



SOP-8/MSOP-8/TSSOP-8



VSSOP-8

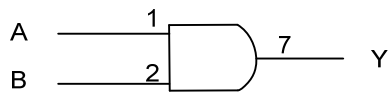


CDFN2030-8

FUNCTION TABLE (each gate)

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

LOGIC DIAGRAM (positive logic)



■ ABSOLUTE MAXIMUM RATINGS (unless otherwise specified)(Note 1,2)

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
Input Clamp Current	I_{IK}	$V_{IN} < 0$ or $V_{IN} > V_{CC}$	± 20	mA
Output Clamp Current	I_{OK}	$V_{OUT} < 0$ or $V_{OUT} > V_{CC}$	± 20	mA
Output Current	I_{OUT}	$V_{OUT} = 0$ to V_{CC}	25	mA
V_{CC} or GND Current	I_{CC}		± 50	mA
Power dissipation	SOP-8	P_D	350	mW
	MSOP-8		300	mW
	TSSOP-8		300	mW
	VSSOP-8		250	mW
	CDFN2030-8			
Storage Temperature	T_{STG}		-65 ~ +150	°C

Notes: 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.

■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}		2.0		6.0	V
Input Voltage	V_{IN}		0		V_{CC}	V
Output Voltage	V_{OUT}		0		V_{CC}	V
Input Transition Rise or Fall Times	t_R, t_F	$V_{CC}=2.0V$			1000	ns
		$V_{CC}=4.5V$			500	ns
		$V_{CC}=6V$			400	ns
Operating Temperature	T_A		-40		+125	°C

■ STATIC CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-Level Input Voltage	V_{IH}	$V_{CC}=2.0V$	1.5			V
		$V_{CC}=4.5V$	3.15			V
		$V_{CC}=6.0V$	4.2			V
Low-Level Input Voltage	V_{IL}	$V_{CC}=2.0V$			0.5	V
		$V_{CC}=4.5V$			1.35	V
		$V_{CC}=6.0V$			1.8	V
High-Level Output Voltage	V_{OH}	$V_{CC}=2.0V, I_{OH}=-20\mu A$	1.9	2.0		V
		$V_{CC}=4.5V, I_{OH}=-20\mu A$	4.4	4.5		V
		$V_{CC}=6.0V, I_{OH}=-20\mu A$	5.9	6.0		V
		$V_{CC}=4.5V, I_{OH}=-4mA$	4.13	4.3		V
		$V_{CC}=6.0V, I_{OH}=-5.2mA$	5.63	5.8		V
Low-Level Output Voltage	V_{OL}	$V_{CC}=2.0V, I_{OL}=20\mu A$		0	0.1	V
		$V_{CC}=4.5V, I_{OL}=20\mu A$		0	0.1	V
		$V_{CC}=6.0V, I_{OL}=20\mu A$		0	0.1	V
		$V_{CC}=4.5V, I_{OL}=4mA$		0.15	0.33	V
		$V_{CC}=6.0V, I_{OL}=5.2mA$		0.17	0.33	V
Input Leakage Current	$I_{I(LEAK)}$	$V_{CC}=6.0V, V_{IN}=V_{CC}$ or GND			± 1	μA
Quiescent Supply Current	I_Q	$V_{CC}=6.0V, V_{IN}=V_{CC}$ or GND, $I_{OUT}=0A$			10	μA
Input Capacitance	C_{IN}			1.5		pF

■ DYNAMIC CHARACTERISTICS (Input: $t_R, t_F \leq 6\text{ns}$; $P_{RR} \leq 1\text{MHz}$)

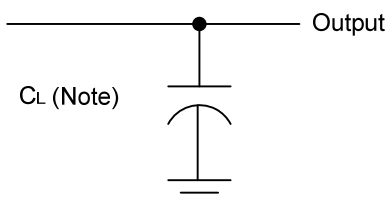
See Fig. 1 and Fig. 2 for test circuit and waveforms.

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation Delay From Input (A and B) to Output (Y)	t_{PHL} / t_{PLH}	$V_{CC}=2.0\text{V}, C_L=50\text{pF}$			95	ns
		$V_{CC}=4.5\text{V}, C_L=50\text{pF}$			19	ns
		$V_{CC}=6.0\text{V}, C_L=50\text{pF}$			16	ns
Output Transition Time	t_{THL} / t_{TLH}	$V_{CC}=2.0\text{V}, C_L=50\text{pF}$			95	ns
		$V_{CC}=4.5\text{V}, C_L=50\text{pF}$			19	ns
		$V_{CC}=6.0\text{V}, C_L=50\text{pF}$			16	ns

■ OPERATING CHARACTERISTICS

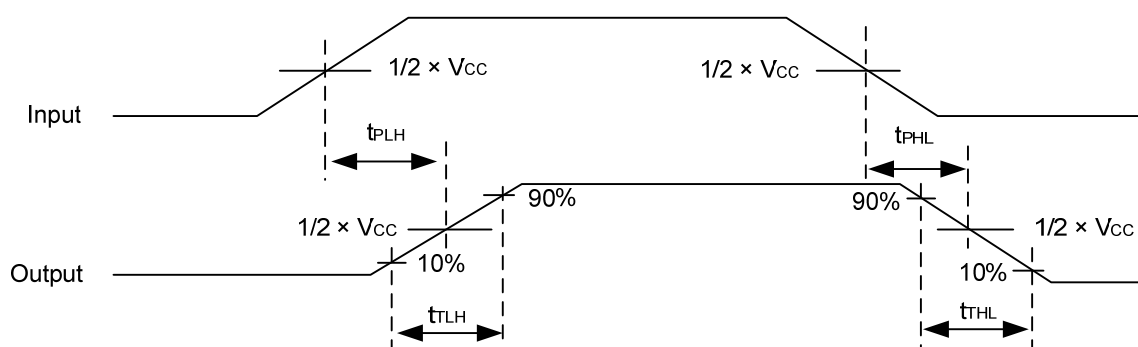
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C_{PD}	No load, $V_{CC}=5\text{V}$, $f=1\text{MHz}$		10		pF

■ TEST CIRCUIT AND WAVEFORMS



Note: C_L includes probe and jig capacitance.

Load circuitry for switching times.



Propagation delay from input(A and B) to output(Y) and Output transition time.

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