



U74LVC08A

CMOS IC

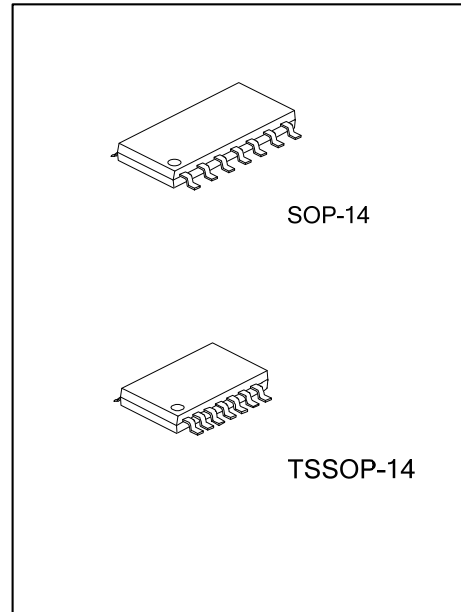
QUAD 2-INPUT AND GATE

DESCRIPTION

The **U74LVC08A** contains four independent 2-input AND gates, perform the Boolean function $Y = A \cdot B$ in positive logic.

FEATURES

- * Operate From 1.65V to 3.6V
- * Direct Interface with TTL Levels
- * Low Power Dissipation
- * Inputs Accept Voltages up to 5.5V
- * Partial-Power-Down Mode Operation

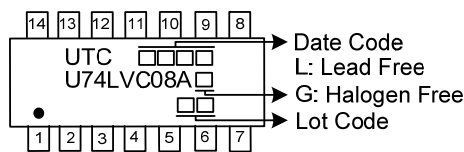


ORDERING INFORMATION

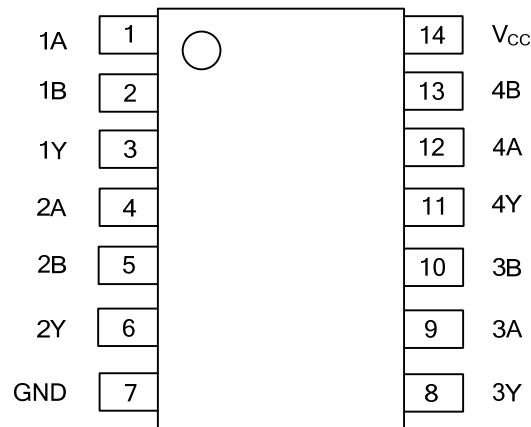
Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74LVC08AL-S14-R	U74LVC08AG-S14-R	SOP-14	Tape Reel
U74LVC08AL-P14-R	U74LVC08AG-P14-R	TSSOP-14	Tape Reel

<p>U74LVC08AG-S14-R</p>	<p>(1) R: Tape Reel (2) P14: TSSOP-14, S14: SOP-14 (3) G: Halogen Free and Lead Free, L: Lead Free</p>
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MARKING



■ PIN CONFIGURATION

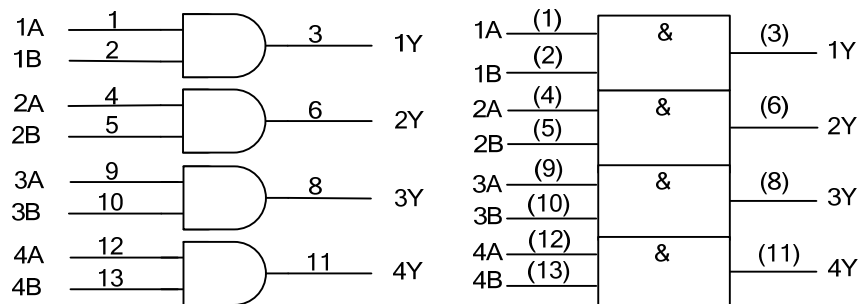


■ FUNCTION TABLE (Each Gate)

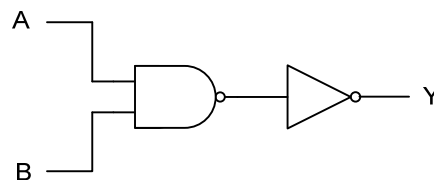
INPUT(nA)	INPUT(nB)	OUTPUT(nY)
H	H	H
H	L	L
L	H	L
L	L	L

Note: H: HIGH voltage level; L: LOW voltage level.

■ LOGIC DIAGRAM (Positive Logic)



■ LOGIC DIAGRAM



■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	-0.5 ~ +6.5	V
Input Voltage	V_{IN}	-0.5 ~ +6.5	V
Output Voltage	V_{OUT}	-0.5 ~ $V_{CC} + 0.5$	V
V_{CC} or GND Current	I_{CC}	±100	mA
Continuous Output Current ($V_{OUT}=0$ to V_{CC})	I_{OUT}	±50	mA
Input Clamp Current ($V_{IN} < 0$)	I_{IK}	-50	mA
Output Clamp Current ($V_{OUT} < 0$)	I_{OK}	-50	mA
Power Dissipation ($T_{OPR} = -40^{\circ}\text{C} \sim +125^{\circ}\text{C}$)	P_D	500	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	RATINGS	UNIT
Supply Voltage	V_{CC}	+1.65 ~ 3.6	V
Input Voltage	V_{IN}	0 ~ 5.5	V
Output Voltage (High or Low state)	V_{OUT}	0 ~ V_{CC}	V
Ambient Operating Temperature	T_{OPR}	-40 ~ +85	$^{\circ}\text{C}$
Input Rise or Fall Times	t_R / t_F	8	ns/V

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	86	$^{\circ}\text{C/W}$
		113	$^{\circ}\text{C/W}$

■ ELECTRICAL CHARACTERISTICS (T_A=25°C , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
High-Level Input Voltage	V _{IH}	V _{CC} = 1.65V~1.95V	0.65× V _{CC}			V	
		V _{CC} = 2.3V ~ 2.7V	1.7			V	
		V _{CC} = 2.7V ~ 3.6V	2				
Low-Level Input Voltage	V _{IL}	V _{CC} = 1.65V~1.95V			0.35× V _{CC}	V	
		V _{CC} = 2.3V ~ 2.7V			0.7	V	
		V _{CC} = 2.7V ~ 3.6V			0.8		
High-Level Output Voltage	V _{OH}	V _{CC} =1.65V~3.6V, I _{OH} =-100μA	V _{CC} -0.2			V	
		V _{CC} =1.65V, I _{OH} =-4mA	1.29			V	
		V _{CC} =2.3V, I _{OH} =-8mA	1.9				
		V _{CC} =2.7V	I _{OH} =-12mA	2.2			V
		V _{CC} =3.0V		2.4			
		V _{CC} =3.0V, I _{OH} =-24mA	2.3			V	
Low-Level Output Voltage	V _{OL}	V _{CC} =1.65V~3.6V, I _{OL} =100μA			0.1	V	
		V _{CC} =1.65V, I _{OL} =-4mA			0.24		
		V _{CC} =2.3V, I _{OL} =-8mA			0.3	V	
		V _{CC} =2.7V, I _{OL} =12mA			0.4		
		V _{CC} =3.0V, I _{OL} =24mA			0.55	V	
Input Leakage Current	I _{I(LEAK)}	V _{CC} =3.6V, V _I =5.5V or GND			±1	μA	
Quiescent Supply Current	I _Q	V _{CC} =3.6V, V _{IN} =5.5V or GND I _{OUT} =0			1	μA	
Additional Quiescent Supply Current Per Input Pin	ΔI _Q	V _{CC} =2.7V~3.6V, One input at V _{IN} =V _{CC} - 0.6V, other input at V _{CC} or GND			500	μA	
Input Capacitance	C _{IN}	V _{IN} = V _{CC} or GND, V _{CC} = 3.3V		5		pF	

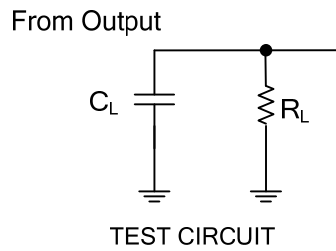
■ SWITCHING CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
Propagation delay from input (nA or nB) to output(nY)	t _{PD}	V _{CC} =1.8V±0.15V, C _L =30pF, R _L =1kΩ	1	5	9.3	ns	
		V _{CC} =2.5V±0.2V, C _L =30pF, R _L =500Ω	1	2.9	6.4		
		V _{CC} =2.7V	C _L =50 pF, R _L =500Ω	1	3		4.6
		V _{CC} =3.3V±0.3V		1	2.6		3.9

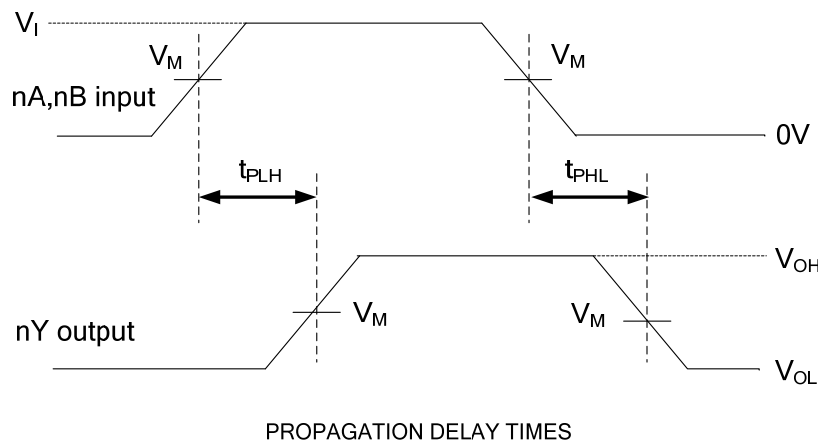
■ OPERATING CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C _{PD}	f =1MHz, No load	V _{CC} =1.8V		7	pF
			V _{CC} =2.5V		9.8	
			V _{CC} =3.3V		10	

■ TEST CIRCUIT AND WAVEFORMS



V_{CC}	Inputs		V_M	C_L	R_L
	V_{IN}	t_R, t_F			
$V_{CC}=1.8V\pm0.15V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	30pF	1k Ω
$V_{CC}=2.5V\pm0.2V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	30pF	500 Ω
$V_{CC}=2.7V$	2.7V	$\leq 2.5ns$	1.5V	50pF	500 Ω
$V_{CC}=3.3V\pm0.3V$	2.7V	$\leq 2.5ns$	1.5V	50pF	500 Ω



Notes: 1. C_L includes probe and jig capacitance.

2. All input pulses are supplied by generators having the following characteristics:

PRR $\leq 10MHz$, $Z_o = 50\Omega$, $t_R \leq 2.5ns$, $t_F \leq 2.5ns$.

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