



U74LVC08A

CMOS IC

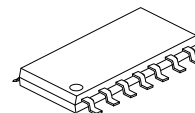
QUAD 2-INPUT AND GATE

■ DESCRIPTION

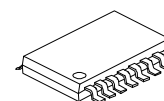
The **U74LVC08A** contains four independent 2-input AND gates, perform the Boolean function $Y = A \cdot B$ in positive logic.

■ FEATURES

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



SOP-14



TSSOP-14

■ ORDERING INFORMATION

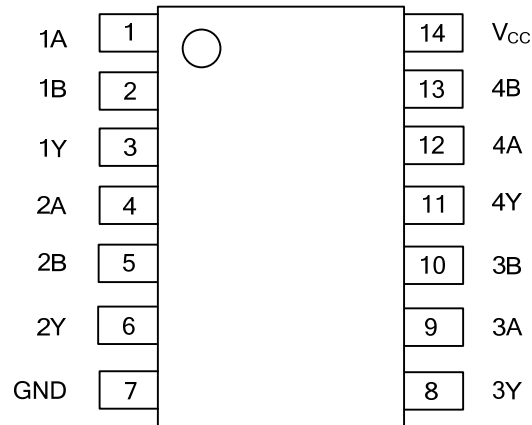
Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74LVC08AL-S14-R	U74LVC08AG-S14-R	SOP-14	Tape Reel
U74LVC08AL-P14-R	U74LVC08AG-P14-R	TSSOP-14	Tape Reel

U74LVC08AL-P14-R

- (1) Packing Type
- (2) Package Type
- (3) Lead Free

- (1) R: Tape Reel
- (2) P14: TSSOP-14, S14: SOP-14
- (3) G: Halogen Free, L: Lead Free

PIN CONFIGURATION

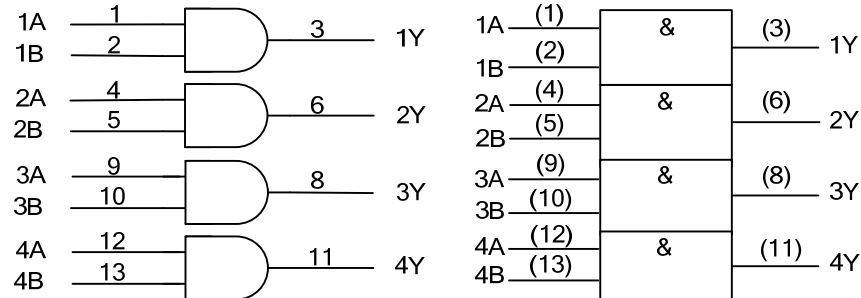


FUNCTION TABLE (Each Gate)

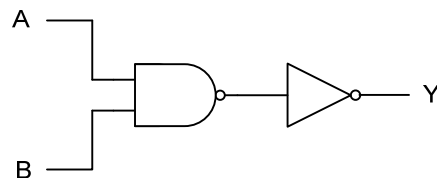
INPUT(nA)	INPUT(nB)	OUTPUT(nY)
H	H	H
H	L	L
L	H	L
L	L	L

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}	113	$^{\circ}\text{C/W}$

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

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

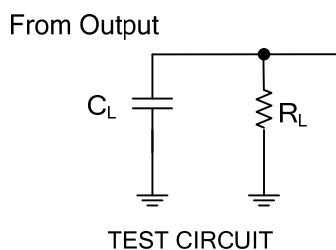
SWITCHING CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from input (nA or nB) to output(nY)	t_{PD}	$V_{CC}=1.8V\pm0.15V$ $C_L=30pF$, $R_L=1k\Omega$	1	5	9.3	ns
		$V_{CC}=2.5V\pm0.2V$ $C_L=30pF$, $R_L=500\Omega$	1	2.9	6.4	
		$V_{CC}=2.7V$ $C_L=50 pF$, $R_L=500\Omega$	1	3	4.6	
		$V_{CC}=3.3V\pm0.3V$	1	2.6	3.9	

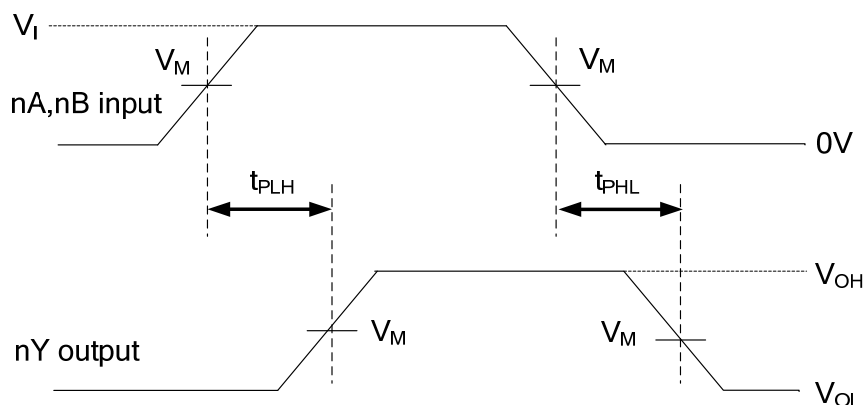
OPERATING CHARACTERISTICS

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



Note: C_L includes probe and jig capacitance.

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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