



## U74LVC08A

CMOS IC

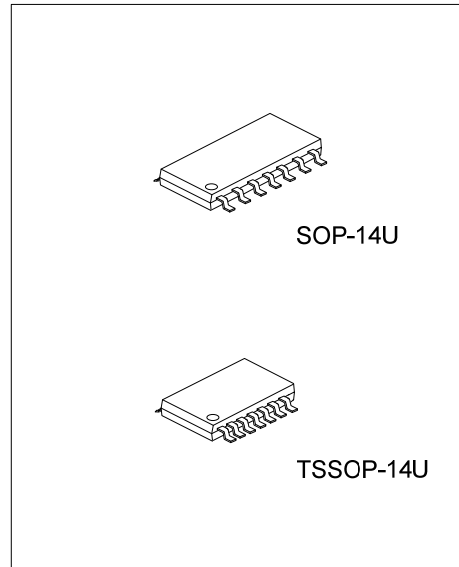
### QUAD 2-INPUT AND GATE

#### 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

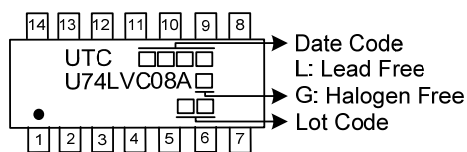


#### ORDERING INFORMATION

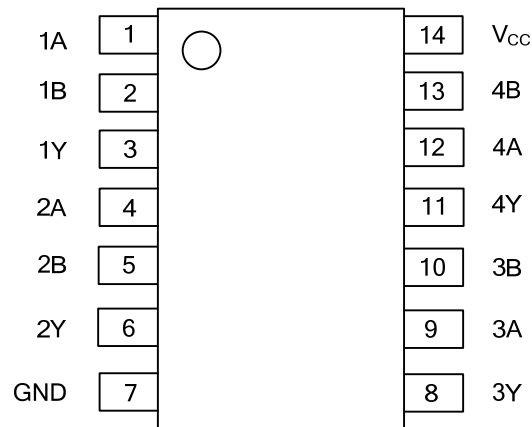
Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74LVC08AL-UEA-R	U74LVC08AG-UEA-R	SOP-14U	Tape Reel
U74LVC08AL-UEB-R	U74LVC08AG-UEB-R	TSSOP-14U	Tape Reel

<p>U74LVC08AG-UEA-R</p> <p>(1) Packing Type (2) Package Type (3) Green Package</p>	<p>(1) R: Tape Reel (2) UEA: SOP-14U, UEB: TSSOP-14U (3) G: Halogen Free and Lead Free, L: Lead Free</p>
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#### MARKING



■ PIN CONFIGURATION

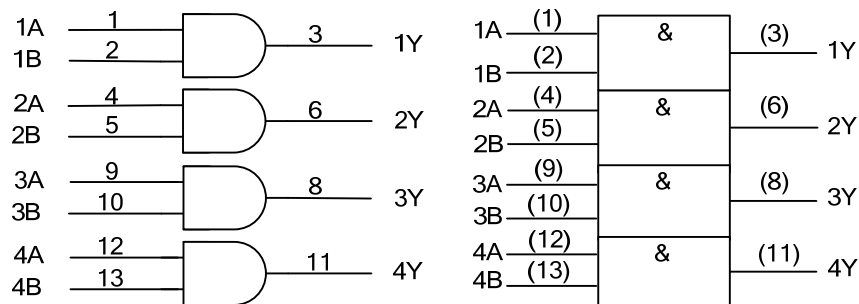


■ FUNCTION TABLE (Each Gate)

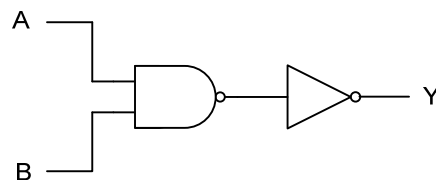
INPUT(nA)	INPUT(nB)	OUTPUT(nY)
H	H	H
H	L	L
L	H	L
L	L	L

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 <sub>CC</sub>	-0.5 ~ +6.5	V
Input Voltage	V <sub>IN</sub>	-0.5 ~ +6.5	V
Output Voltage	V <sub>OUT</sub>	-0.5 ~ V <sub>CC</sub> +0.5	V
V <sub>CC</sub> or GND Current	I <sub>CC</sub>	±100	mA
Continuous Output Current (V <sub>OUT</sub> =0 to V <sub>CC</sub> )	I <sub>OUT</sub>	±50	mA
Input Clamp Current (V <sub>IN</sub> <0)	I <sub>IK</sub>	-50	mA
Output Clamp Current (V <sub>OUT</sub> < 0)	I <sub>OK</sub>	-50	mA
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	RATINGS	UNIT
Supply Voltage	V <sub>CC</sub>	1.65 ~ 3.6	V
Input Voltage	V <sub>IN</sub>	0 ~ 5.5	V
Output Voltage (High or Low state)	V <sub>OUT</sub>	0 ~ V <sub>CC</sub>	V
Input Rise or Fall Times	t <sub>R</sub> / t <sub>F</sub>	8	ns/V
Ambient Operating Temperature	T <sub>A</sub>	-40 ~ +125	°C

### ■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT	
Junction to Ambient	θ <sub>JA</sub>	SOP-14U	125	°C/W
		TSSOP-14U	150	°C/W

## ■ ELECTRICAL CHARACTERISTICS (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	T <sub>A</sub> =25°C			T <sub>A</sub> =-40~+125°C			UNIT	
			MIN	TYP	MAX	MIN	TYP	MAX		
High-Level Input Voltage	V <sub>IH</sub>	V <sub>CC</sub> = 1.65V~1.95V	0.65×			0.65×			V	
		V <sub>CC</sub> = 2.3V ~ 2.7V	1.7			1.7			V	
		V <sub>CC</sub> = 2.7V ~ 3.6V	2			2				
Low-Level Input Voltage	V <sub>IL</sub>	V <sub>CC</sub> = 1.65V~1.95V			0.35×			0.35×	V	
		V <sub>CC</sub> = 2.3V ~ 2.7V			0.7			0.7	V	
		V <sub>CC</sub> = 2.7V ~ 3.6V			0.8			0.8		
High-Level Output Voltage	V <sub>OH</sub>	V <sub>CC</sub> =1.65V~3.6V, I <sub>OH</sub> =-100μA	V <sub>CC</sub>			V <sub>CC</sub>			V	
		V <sub>CC</sub> =1.65V, I <sub>OH</sub> =-4mA	1.29			1.05			V	
		V <sub>CC</sub> =2.3V, I <sub>OH</sub> =-8mA	1.9			1.55				
		V <sub>CC</sub> =2.7V	I <sub>OH</sub> =-12mA	2.2		2.2	2.05			V
		V <sub>CC</sub> =3.0V		2.4		2.4	2.25			
V <sub>CC</sub> =3.0V, I <sub>OH</sub> =-24mA	2.3			2			V			
Low-Level Output Voltage	V <sub>OL</sub>	V <sub>CC</sub> =1.65V~3.6V, I <sub>OL</sub> =100μA			0.1			0.3	V	
		V <sub>CC</sub> =1.65V, I <sub>OL</sub> =-4mA			0.24			0.65	V	
		V <sub>CC</sub> =2.3V, I <sub>OL</sub> =-8mA			0.3			0.8		
		V <sub>CC</sub> =2.7V, I <sub>OL</sub> =12mA			0.4			0.6		
V <sub>CC</sub> =3.0V, I <sub>OL</sub> =24mA			0.55			0.8	V			
Input Leakage Current	I <sub>I(LEAK)</sub>	V <sub>CC</sub> =3.6V, V <sub>I</sub> =5.5V or GND			±1			±20	μA	
Quiescent Supply Current	I <sub>Q</sub>	V <sub>CC</sub> =3.6V, V <sub>IN</sub> =5.5V or GND I <sub>OUT</sub> =0			1			40	μA	
Additional Quiescent Supply Current Per Input Pin	ΔI <sub>Q</sub>	V <sub>CC</sub> =2.7V~3.6V, One input at V <sub>IN</sub> =V <sub>CC</sub> - 0.6V, other input at V <sub>CC</sub> or GND			500			5000	μA	

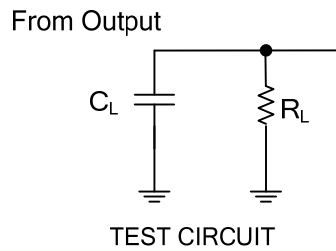
## ■ SWITCHING CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	T <sub>A</sub> =25°C			T <sub>A</sub> =-40~+125°C			UNIT	
			MIN	TYP	MAX	MIN	TYP	MAX		
Propagation delay from input (nA or nB) to output(nY)	t <sub>PD</sub>	V <sub>CC</sub> =1.8V±0.15V, C <sub>L</sub> =30pF, R <sub>L</sub> =1kΩ	1	7	13	1		15	ns	
		V <sub>CC</sub> =2.5V±0.2V, C <sub>L</sub> =30pF, R <sub>L</sub> =500Ω	1	5.9	9.8	1		11	ns	
		V <sub>CC</sub> =2.7V	C <sub>L</sub> =50 pF, R <sub>L</sub> =500Ω	1	5	7.6	1		9	ns
		V <sub>CC</sub> =3.3V±0.3V		1	4.1	5.9	1		7	ns

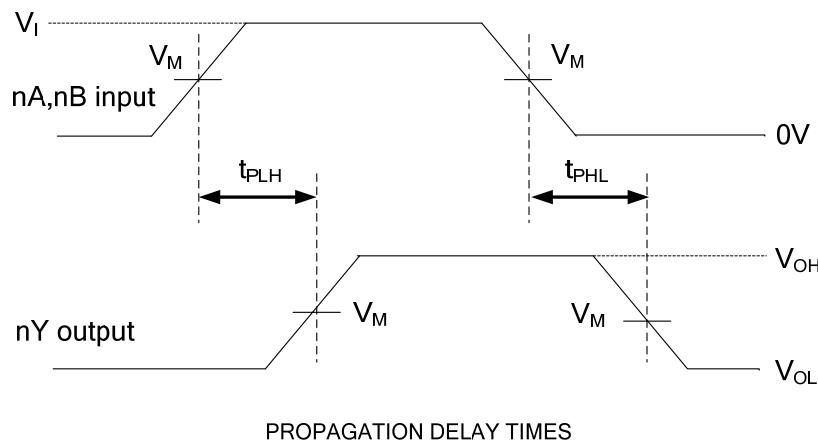
## ■ OPERATING CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Capacitance	C <sub>IN</sub>	V <sub>IN</sub> = V <sub>CC</sub> or GND, V <sub>CC</sub> = 3.3V		5		pF
Power Dissipation Capacitance	C <sub>PD</sub>	f = 1MHz, No load	V <sub>CC</sub> =1.8V		7	pF
			V <sub>CC</sub> =2.5V		9.8	pF
			V <sub>CC</sub> =3.3V		10	pF

## ■ TEST CIRCUIT AND WAVEFORMS



V <sub>CC</sub>	Inputs		V <sub>M</sub>	C <sub>L</sub>	R <sub>L</sub>
	V <sub>IN</sub>	t <sub>R</sub> , t <sub>F</sub>			
V <sub>CC</sub> =1.8V±0.15V	V <sub>CC</sub>	≤2ns	V <sub>CC</sub> /2	30pF	1kΩ
V <sub>CC</sub> =2.5V±0.2V	V <sub>CC</sub>	≤2ns	V <sub>CC</sub> /2	30pF	500Ω
V <sub>CC</sub> =2.7V	2.7V	≤2.5ns	1.5V	50pF	500Ω
V <sub>CC</sub> =3.3V±0.3V,	2.7V	≤2.5ns	1.5V	50pF	500Ω



Notes: 1. C<sub>L</sub> includes probe and jig capacitance.

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

PRR ≤10MHz, Z<sub>o</sub> = 50Ω, t<sub>R</sub> ≤2.5ns, t<sub>F</sub> ≤2.5ns.

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