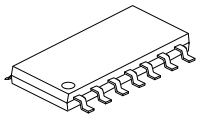
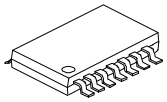
U74LVC08A

CMOS IC

QUAD 2-INPUT AND GATE



SOP-14



TSSOP-14

■ DESCRIPTION

The **U74LVC08A** contains four independent 2-input AND gates, perform the Boolean function Y = A • 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

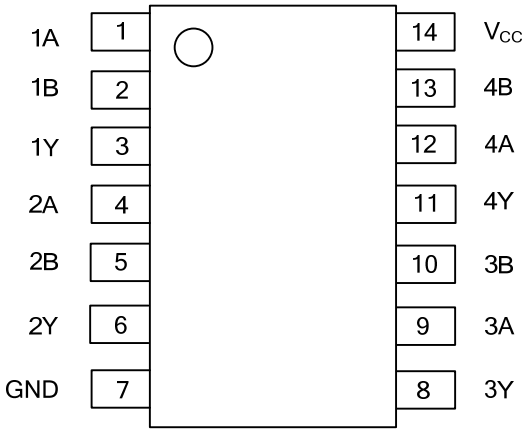
■ ORDERING INFORMATION

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

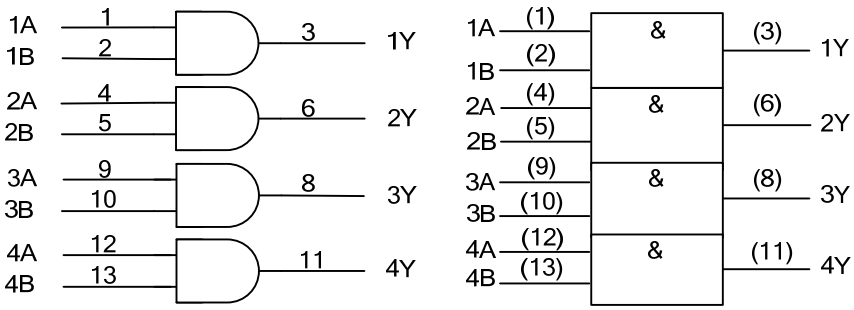


■ FUNCTION TABLE (Each Gate)

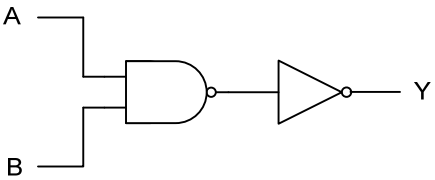
INPUT(nA)	INPUT(nB)	OUTPUT(nY)
H	H	H
H	L	L
L	H	L
L	L	L

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°C ~ +125°C)	P_D	500	mw
Storage Temperature	T_{STG}	-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_{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	°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	°C/W

■ ELECTRICAL CHARACTERISTICS (Ta=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*Vcc			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*Vcc	V
		V_{CC} = 2.3V ~ 2.7V				0.7	V
		V_{CC} = 2.7V ~ 3.6V				0.8	
High-Level Output Voltage	V_{OH}	I_{OH}=-100μA	V_{CC}=1.65V~3.6V	V_{CC}-0.2			V
		I_{OH}=-4mA	V_{CC}=1.65V	1.29			V
		I_{OH}=-8mA	V_{CC}=2.3V	1.9			
		I_{OH}=-12mA	V_{CC}=2.7V	2.2			V
			V_{CC}=3.0V	2.4			
		I_{OH}=-24mA	V_{CC}=3.0V	2.3			V
Low-Level Output Voltage	V_{OL}	I_{OH}=100μA	V_{CC}=1.65V~3.6V			0.1	V
		I_{OH}=-4mA	V_{CC}=1.65V			0.24	V
		I_{OH}=-8mA	V_{CC}=2.3V			0.3	
		I_{OH}=12mA	V_{CC}=2.7V			0.4	
		I_{OH}=24mA	V_{CC}=3.0V			0.55	V
Input Leakage Current	$I_{I(LEAK)}$	VI=5.5V or GND	V_{CC}=3.6V			±1	μA
Quiescent Supply Current	I_Q	V_{IN}=5.5V or GND, I_{OUT}=0	V_{CC}=3.6V			1	μA
Additional Quiescent Supply Current Per Input Pin	ΔI_Q	One input at V_{IN}=V_{CC} – 0.6V, other input at Vcc or GND	V_{CC}=2.7V~3.6V			500	μA
Input Capacitance	C_{IN}	V_{IN} = V_{CC} or GND, V_{CC} = 3.3V			5		pF

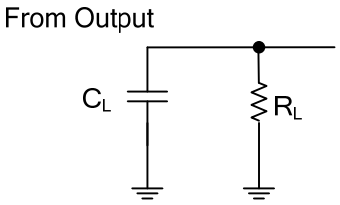
■ SWITCHING CHARACTERISTICS

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

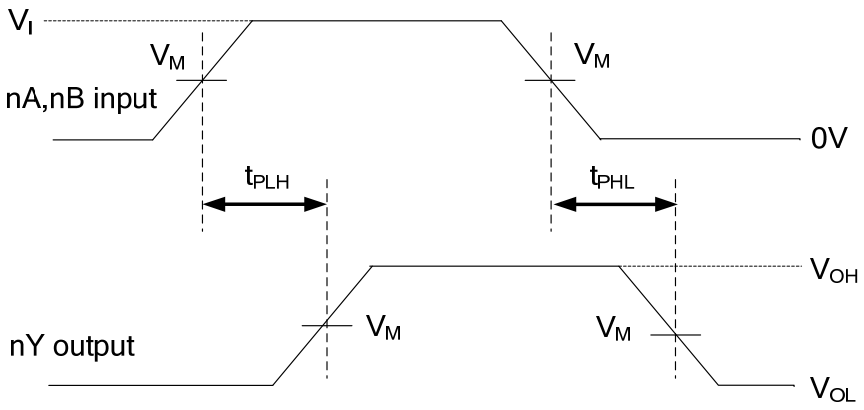
PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C_{PD}	f =1MHz, No load	V_{CC}=1.8V		7		pF
			V_{CC}=2.5V		9.8		
			V_{CC}=3.3V		10		

■ TEST CIRCUIT AND WAVEFORMS



TEST CIRCUIT

V_{CC}	Inputs		V_M	C_L	R_L
	V_{IN}	t_R, t_F			
V_{CC}=1.8V±0.15V	V_{CC}	≤2ns	$V_{CC}/2$	30pF	1kΩ
V_{CC}=2.5V±0.2V	V_{CC}	≤2ns	$V_{CC}/2$	30pF	500Ω
V_{CC}=2.7V	2.7V	≤2.5ns	1.5V	50pF	500Ω
V_{CC}=3.3V±0.3V,	2.7V	≤2.5ns	1.5V	50pF	500Ω



PROPAGATION DELAY TIMES

Note: C_L includes probe and jig capacitance.
All input pulses are supplied by generators having the following characteristics:
PRR ≤10MHz, Zo = 50Ω, t_R ≤2.5ns, t_F ≤2.5ns.