

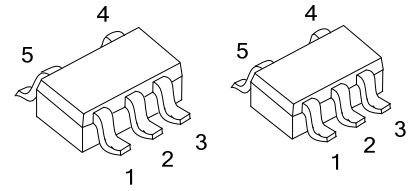
**U74LVC1G08****CMOS IC****2-INPUT AND GATE****DESCRIPTION**

The **U74LVC1G08** is a 2-input AND gate which provides the Function $Y=A \times B$.

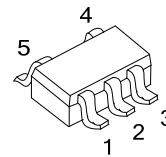
This device has power-down protective circuit to prevent device from destruction when it is powered down.

FEATURES

- * Operation Voltage Range: 1.6V ~ 5.5V
- * Low Power Current: $I_{CC}=10\mu A$ (Max.)
- * $\pm 24mA$ Output Drive ($V_{CC}=3.0V$)
- * Power Down Protection



SOT-25

SOT-23-5
(JEDEC TO-236)

SOT-353



DFN1010-6

ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74LVC1G08L-AE5-R	U74LVC1G08G-AE5-R	SOT-23-5	Tape Reel
U74LVC1G08L-AF5-R	U74LVC1G08G-AF5-R	SOT-25	Tape Reel
U74LVC1G08L-AL5-R	U74LVC1G08G-AL5-R	SOT-353	Tape Reel
U74LVC1G08L-K06-1010-R	U74LVC1G08G-K06-1010-R	DFN1010-6	Tape Reel

U74LVC1G08G-AE5-R

- (1) Packing Type
- (2) Package Type
- (3) Green Package

(1) R: Tape Reel

(2) AE5: SOT-23-5, AF5: SOT-25, AL5: SOT-353

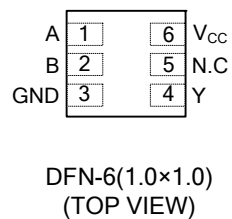
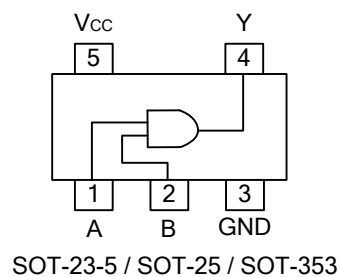
K06-1010: DFN1010-6

(3) G: Halogen Free and Lead Free, L: Lead Free

MARKING

SOT-23-5 / SOT-25 / SOT-353	DFN1010-6
 3Y8 L: Lead Free G: Halogen Free	

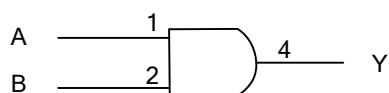
PIN CONFIGURATION



FUNCTION TABLE (each gate)

INPUT		OUTPUT
A	B	Y
L	L	L
L	H	L
H	L	L
H	H	H

LOGIC DIAGRAM (positive logic)



Logic symbol



IEC logic symbol

■ **ABSOLUTE MAXIMUM RATING** ($T_A=25^{\circ}\text{C}$, unless otherwise specified) (Note 2)

PARAMETER	SYMBOL	TEST CONDITIONS	RATINGS	UNIT
Supply Voltage	V_{CC}		-0.5~6.5	V
Input Voltage	V_{IN}		-0.5~6.5	V
Output Voltage	V_{OUT}	Output in the high or low state	-0.5~ $V_{CC}+0.5$	V
		Output in the power-off state	-0.5~6.5	V
Continuous V_{CC} or GND Current	I_{CC}		± 100	mA
Continuous Output Current	I_{OUT}		± 50	mA
Input Clamp Current	I_{IK}	$V_{IN}<0$	-50	mA
Output Clamp Current	I_{OK}	$V_{OUT}<0$	-50	mA
Storage Temperature Range	T_{STG}		-65 ~+150	$^{\circ}\text{C}$

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.

■ **THERMAL DATA**

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	SOT-23-5	280	$^{\circ}\text{C/W}$
	SOT-25	230	$^{\circ}\text{C/W}$
	SOT-353	350	$^{\circ}\text{C/W}$
	DFN1010-6	250	$^{\circ}\text{C/W}$

■ **RECOMMENDED OPERATING CONDITIONS**

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}	Operating	1.65		5.5	V
		Data retention only	1.5			V
Input Voltage	V_{IN}		0		5.5	V
Output Voltage	V_{OUT}	High or low state	0		V_{CC}	V
Input Transition Rise or Fall Rate	$\Delta t/\Delta v$	$V_{CC}=1.8\text{V}\pm 0.15\text{V}$			20	ns/V
		$V_{CC}=2.5\text{V}\pm 0.2\text{V}$				
		$V_{CC}=3.3\text{V}\pm 0.3\text{V}$			10	ns/V
		$V_{CC}=5\text{V}\pm 0.5\text{V}$			5	ns/V
Operating Temperature	T_A		-40		125	$^{\circ}\text{C}$

■ **STATIC CHARACTERISTICS** ($T_A=25^{\circ}\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-Level Input Voltage	V_{IH}	$V_{CC}=1.65\text{V}\sim 1.95\text{V}$	$0.65\times V_{CC}$			V
		$V_{CC}=2.3\text{V}\sim 2.7\text{V}$	1.7			
		$V_{CC}=3.0\text{V}\sim 3.6\text{V}$	2			
		$V_{CC}=4.5\text{V}\sim 5.5\text{V}$	$0.7\times V_{CC}$			
Low-Level Input Voltage	V_{IL}	$V_{CC}=1.65\text{V}\sim 1.95\text{V}$			$0.35\times V_{CC}$	V
		$V_{CC}=2.3\text{V}\sim 2.7\text{V}$			0.7	
		$V_{CC}=3.0\text{V}\sim 3.6\text{V}$			0.8	
		$V_{CC}=4.5\text{V}\sim 5.5\text{V}$			$0.3\times V_{CC}$	
High-Level Output Voltage	V_{OH}	$V_{CC}=1.65\text{V}\sim 5.5\text{V}$, $I_{OH}=-100\mu\text{A}$	$V_{CC}-0.1$			V
		$V_{CC}=1.65\text{V}$, $I_{OH}=-4\text{mA}$	1.2			
		$V_{CC}=2.3\text{V}$, $I_{OH}=-8\text{mA}$	1.9			
		$V_{CC}=3.0\text{V}$, $I_{OH}=-16\text{mA}$	2.4			
		$V_{CC}=3.0\text{V}$, $I_{OH}=-24\text{mA}$	2.3			
		$V_{CC}=4.5\text{V}$, $I_{OH}=-32\text{mA}$	3.8			

■ STATIC CHARACTERISTICS (Cont.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Low-Level Output Voltage	V_{OL}	$V_{CC}=1.65V \sim 5.5V, I_{OL}=100\mu A$			0.1	V
		$V_{CC}=1.65V, I_{OL}=4mA$			0.45	
		$V_{CC}=2.3V, I_{OL}=8mA$			0.3	
		$V_{CC}=3.0V, I_{OL}=16mA$			0.4	
		$V_{CC}=3.0V, I_{OL}=24mA$			0.55	
		$V_{CC}=4.5V, I_{OL}=32mA$			0.55	
Input Leakage Current	$I_{I(LEAK)}$	$V_{CC}=0V \sim 5.5V, V_{IN}=5.5V$ or GND			± 5	μA
Power OFF Leakage Current	I_{OFF}	$V_{CC}=0V, V_{IN}$ or $V_{OUT}=5.5V$			± 10	μA
Quiescent Supply Current	I_Q	$V_{CC}=1.65V \sim 5.5V, V_{IN}=5.5V$ or GND $I_{OUT}=0$			10	μA
Additional Quiescent Supply Current	ΔI_Q	$V_{CC}=3V \sim 5.5V$, One input at $V_{CC}-0.6V$, other inputs at V_{CC} or GND			500	μA
Input Capacitance	C_{IN}	$V_{CC}=3.3V, V_{IN}=V_{CC}$ or GND		4		pF

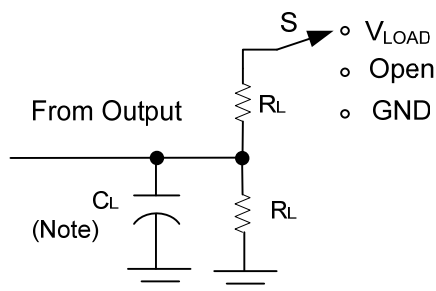
■ DYNAMIC CHARACTERISTICS ($T_A=25^\circ C$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from input (A or B) to output(Y)	t_{PLH}/t_{PHL}	$C_L=15pF$	$V_{CC}=1.8V \pm 0.15V$	1.5	7.2	ns
			$V_{CC}=2.5V \pm 0.2V$	0.7	4.4	ns
			$V_{CC}=3.3V \pm 0.3V$	0.8	3.6	ns
			$V_{CC}=5V \pm 0.5V$	0.8	3.4	ns
		$C_L=30$ or $50pF$	$V_{CC}=1.8V \pm 0.15V$	2.4	8	ns
			$V_{CC}=2.5V \pm 0.2V$	1.1	5.5	ns
			$V_{CC}=3.3V \pm 0.3V$	1	4.5	ns
			$V_{CC}=5V \pm 0.5V$	1	4	ns

■ OPERATING CHARACTERISTICS ($f=10MHz, T_A=25^\circ C$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C_{PD}	$V_{CC}=1.8V$		21		pF
		$V_{CC}=2.5V$		24		pF
		$V_{CC}=3.3V$		26		pF
		$V_{CC}=5V$		31		pF

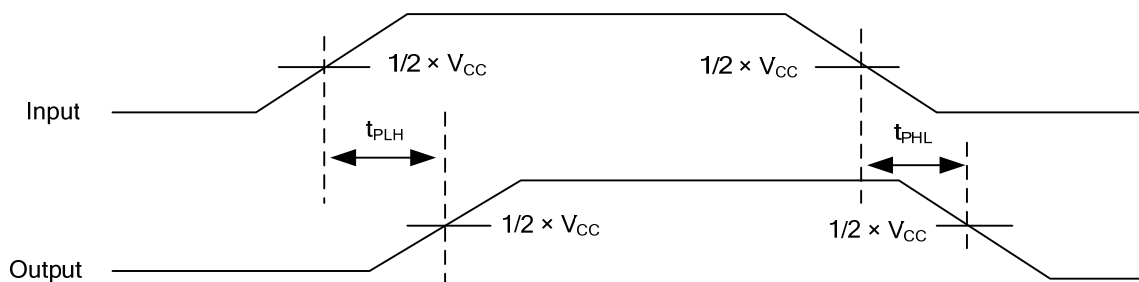
■ TEST CIRCUIT AND WAVEFORMS



TEST	S
t_{PLH}/t_{PHL}	Open
t_{PHZ}/t_{PZH}	GND
t_{PLZ}/t_{PZL}	V_{LOAD}

Note: C_L includes probe and jig capacitance.

V_{CC}	V_{IN}	t_R/t_F	V_M	V_{LOAD}	C_L	R_L	V_{Δ}
$1.8V \pm 0.15V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	$2 \times V_{CC}$	15pF	1M Ω	0.15V
$2.5V \pm 0.2V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	$2 \times V_{CC}$	15pF	1M Ω	0.15V
$3.3V \pm 0.3V$	3 V	$\leq 2.5ns$	1.5V	6V	15pF	1M Ω	0.3V
$5V \pm 0.5V$	V_{CC}	$\leq 2.5ns$	$V_{CC}/2$	$2 \times V_{CC}$	15pF	1M Ω	0.3V
$1.8V \pm 0.15V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	$2V_{CC}$	30pF	1K Ω	0.15V
$2.5V \pm 0.2V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	$2 \times V_{CC}$	30pF	500 Ω	0.15V
$3.3V \pm 0.3V$	3 V	$\leq 2.5ns$	1.5V	6V	50pF	500 Ω	0.3V
$5V \pm 0.5V$	V_{CC}	$\leq 2.5ns$	$V_{CC}/2$	$2 \times V_{CC}$	50pF	500 Ω	0.3V



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