



U74LVC1G08

CMOS IC

2-INPUT AND GATE

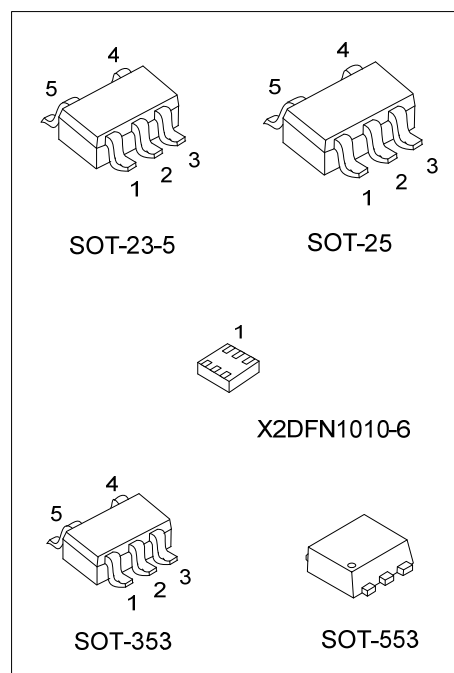
DESCRIPTION

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: 1.65V ~ 5.5V
- * Low Power Current: $I_{CC}=10\mu A$ (Max.)
- * $\pm 24mA$ Output Drive ($V_{CC}=3.0V$)
- * Power Down Protection



ORDERING INFORMATION

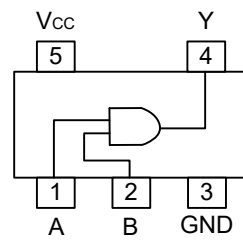
Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74LVC1G08L-AE5-R	U74LVC1G08G-AE5-R	SOT-23-5	Tape Reel
U74LVC1G08L-AF5-R	U74LVC1G08G-AF5-R	SOT-25	Tape Reel
U74LVC1G08L-AL5-R	U74LVC1G08G-AL5-R	SOT-353	Tape Reel
U74LVC1G08L-AN5-R	U74LVC1G08G-AN5-R	SOT-553	Tape Reel
U74LVC1G08L-K06-1010X2-R	U74LVC1G08G-K06-1010X2-R	X2DFN1010-6	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 AN5: SOT-553, K06-1010X2: X2DFN1010-6 (3) G: Halogen Free and Lead Free, L: Lead Free
---	--

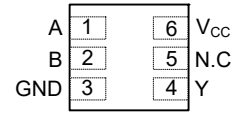
MARKING

SOT-23-5 / SOT-25 / SOT-353 / SOT-553	X2DFN1010-6
3Y8 L: Lead Free G: Halogen Free	Y8

PIN CONFIGURATION



SOT-23-5 / SOT-25
SOT-353 / SOT-553

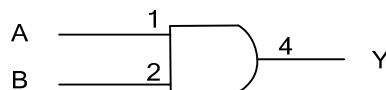


X2DFN1010-6
(TOP VIEW)

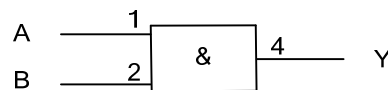
FUNCTION TABLE (each gate)

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°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	°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.

■ **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	t _r / t _f	V _{CC} =1.8V±0.15V			20	ns/V
		V _{CC} =2.5V±0.2V				
		V _{CC} =3.3V±0.3V			10	ns/V
		V _{CC} =5V±0.5V			5	ns/V
Operating Temperature	T _A		-40		+125	°C

■ **THERMAL DATA**

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	SOT-23-5	θ _{JA}	280	°C/W
	SOT-25		230	°C/W
	SOT-353		350	°C/W
	SOT-553		370	°C/W
	X2DFN1010-6		420	°C/W

■ **STATIC CHARACTERISTICS** (unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	T _A =25°C			T _A =-40°C~+125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
High-Level Input Voltage	V _{IH}	V _{CC} = 1.65V~1.95V	0.65× V _{CC}			0.65× V _{CC}			V
		V _{CC} = 2.3V~2.7V	1.7			1.7			
		V _{CC} = 3.0V~3.6V	2			2			
		V _{CC} = 4.5V~5.5V	0.7× V _{CC}			0.7× V _{CC}			
Low-Level Input Voltage	V _{IL}	V _{CC} = 1.65V~1.95V			0.35× V _{CC}			0.35× V _{CC}	V
		V _{CC} = 2.3V~2.7V			0.7			0.7	
		V _{CC} = 3.0V~3.6V			0.8			0.8	
		V _{CC} = 4.5V~5.5V			0.3× V _{CC}			0.3× V _{CC}	

■ STATIC CHARACTERISTICS (Cont.)

PARAMETER	SYMBOL	TEST CONDITIONS	T _A =25°C			T _A =-40°C~+125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
High-Level Output Voltage	V _{OH}	V _{CC} =1.65V ~ 5.5V, I _{OH} =-100μA	V _{CC} -0.1			V _{CC} -0.1			V
		V _{CC} =1.65V, I _{OH} =-4mA	1.2			0.95			
		V _{CC} =2.3V, I _{OH} =-8mA	1.9			1.7			
		V _{CC} =3.0V I _{OH} =-16mA	2.4			2.1			
		I _{OH} =-24mA	2.3			2			
		V _{CC} =4.5V, I _{OH} =-32mA	3.8			3.4			
Low-Level Output Voltage	V _{OL}	V _{CC} =1.65V ~ 5.5V, I _{OL} =100μA			0.1			0.1	V
		V _{CC} =1.65V, I _{OL} =4mA			0.45			0.7	
		V _{CC} =2.3V, I _{OL} =8mA			0.3			0.45	
		V _{CC} =3.0V I _{OL} =16mA			0.4			0.6	
		I _{OL} =24mA			0.55			0.8	
		V _{CC} =4.5V, I _{OL} =32mA			0.55			0.8	
Input Leakage Current	I _{I(LEAK)}	V _{CC} =0V ~ 5.5V, V _{IN} =5.5V or GND			±5			±5	μA
Power OFF Leakage Current	I _{OFF}	V _{CC} =0V, V _{IN} or V _{OUT} =5.5V			±10			±10	μA
Quiescent Supply Current	I _Q	V _{CC} =1.65V~5.5V, V _{IN} =5.5V or GND I _{OUT} =0			10			10	μA
Additional Quiescent Supply Current	ΔI _Q	V _{CC} =3V~5.5V, One input at V _{CC} -0.6V, other inputs at V _{CC} or GND			500			500	μA

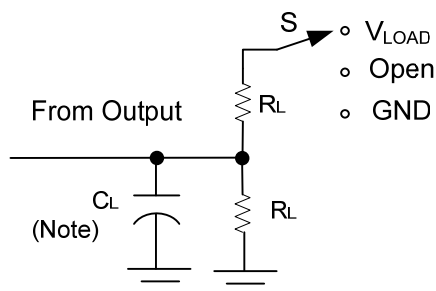
■ DYNAMIC CHARACTERISTICS (unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	T _A =25°C			T _A =-40°C~+125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
Propagation delay from input (A or B) to output(Y)	t _{PLH} /t _{PHL}	C _L =15pF	V _{CC} =1.8V±0.15V	1.5		10		12.5	ns
			V _{CC} =2.5V±0.2V	0.7		8		10.5	ns
			V _{CC} =3.3V±0.3V	0.8		6		8.5	ns
			V _{CC} =5V±0.5V	0.8		4.2		6	ns
		C _L =30 or 50pF	V _{CC} =1.8V±0.15V	2.4		11		13.5	ns
			V _{CC} =2.5V±0.2V	1.1		9		11.5	ns
			V _{CC} =3.3V±0.3V	1		8		10.5	ns
			V _{CC} =5V±0.5V	1		7		9.5	ns

■ OPERATING CHARACTERISTICS (f=10MHz, T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Capacitance	C _{IN}	V _{CC} =3.3V, V _{IN} =V _{CC} or GND		4		pF
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

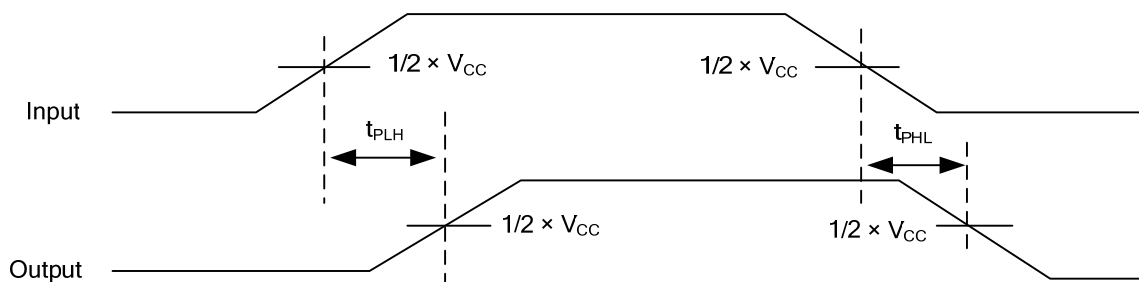
■ TEST CIRCUIT AND WAVEFORMS



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



UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. UTC reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.